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THE
BUTTERFLIES
OF
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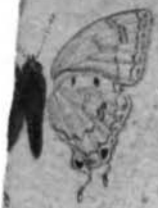

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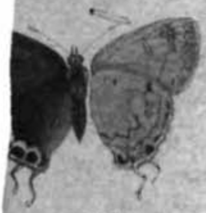

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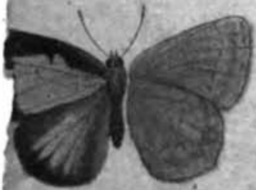

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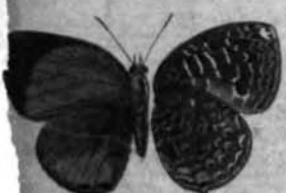

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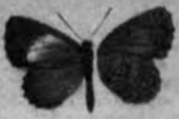

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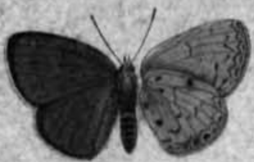

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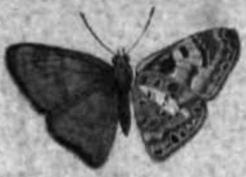

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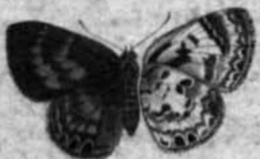

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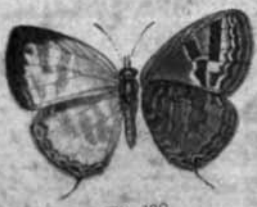

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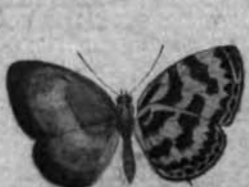

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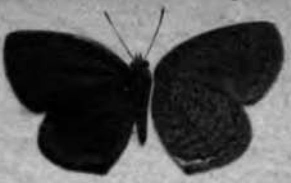

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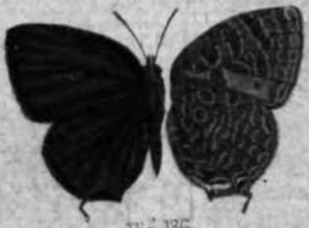

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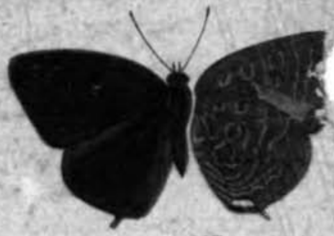

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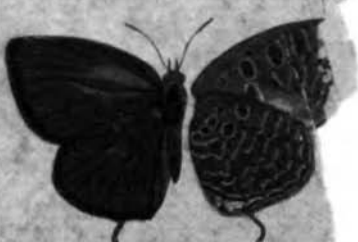

Fig. 138.

THE

BUTTERFLIES

OF

INDIA, BURMAH AND CEYLON.

A DESCRIPTIVE HANDBOOK OF ALL THE KNOWN SPECIES OF RHOPALOCEROUS LEPIDOPTERA INHABITING THAT REGION, WITH NOTICES OF ALLIED SPECIES OCCURRING IN THE NEIGHBOURING COUNTRIES ALONG THE BORDER; WITH NUMEROUS ILLUSTRATIONS.

BY

LIONEL DE NICÉVILLE,

Fellow of the Entomological Society, London, Member of the Asiatic Society, Bengal; and Corresponding Member of the Zoological Society, London.

VOLUME III.

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Drawn by Babu Grish Chunder Chuckerbutty and Babu Behary Lall Dass.
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PREFACE TO VOL. III.

The first volume of "The Butterflies of India, Burmah and Ceylon" was published in August, 1883, the second in October, 1886, the third is now issued after about the same interval of rather over three years from the second as intervened between the second and the first. These long intervals are much to be regretted, but they have proved to be unavoidable. To European residents in India an occasional holiday is necessary for health's sake alone, and hence, in accordance with the old saw that "All work and no play makes Jack a dull boy," I spent six months in Kashmir during the summer of 1887, during which period my work on this book necessarily came to a standstill. But, excluding this interval of rest and recreation, I have worked steadily and continuously at this volume during my leisure time, usually devoting to it at least three or four hours, and often more, on every day since Volume II was issued. The present volume represents 1,400 sheets of foolscap manuscript, the passing of which through the press has alone taken more than a year, the whole of the MS. having been placed in the printer's hands on New Year's Day, 1889. I mention these facts because surprise has been expressed that the production of a single volume should occupy so long a time.

I have still deeply to regret that Colonel G. F. L Marshall, R.E, has been able, mainly owing to ill-health, but partly from pressure of official duties, to do so little to the work. He was enabled, however, before he left India on leave, to give me considerable preliminary assistance in the preparation of the MS., for which I now tender him my grateful thanks.

To Colonel A. M. Lang, R E., I am much indebted for considerable help with the Introduction to the volume, and in the construction of the Key to the Genera. Very unfortunately for me he has retired from the service and left India, and hence is no longer at hand to assist me with his great and valued experience.

Professor J. Wood-Mason, the Superintendent of the Indian Museum, has most kindly read through a final proof of every page in the volume, from his great zoological knowledge and experience rendered me much help, and allowed me the freest use of the collections of specimens and of books in the institution under his direction; all of which I hereby gratefully acknowledge.

It remains only for me to express my most sincere thanks to the following gentlemen for their valuable assistance rendered during the progress of this volume. In the first position amongst these I place my late dear friend Otto Moller of Tukvar, Darjiling, than whom a more generous man never lived, and whose entire collection, together with the stores of knowledge he had acquired, during the many years he had studied the butterflies of Sikkim and Bhutan, was unreservedly placed at my service. His untimely death a year ago is a great loss to entomology, and an irreparable one to me. Messrs. A. V. Knyvett, G. C Dudgeon, and J. Gammie have most kindly allowed me the use of any specimens in their Sikkim collections that I required, especially the first-named, who, in addition to his Sikkim collection, possesses a splendid series of the butterflies of the little-known neighbouring country of Bhutan. To the Rev. Walter A. Hamilton my best thanks are due for the immense number of specimens that he has given me from the Khasi Hills, where he has employed many native collectors for the past two or three years, during which period he has discovered many species new to science (which I have had the pleasure of describing), besides obtaining beautiful series of many species that had hitherto been very rarely met with in collections. He has carried his generosity in many instances so far as to present me with unique specimens. Mr. P. W. Mackinnon too has aided me largely by the gift of splendid series of specimens from Masuri and from the inner ranges of the Western Himalayas extending up to the sources of the Ganges and Jumna rivers. For the gift of many butterflies, larvæ, and pupæ, I am indebted to Mr. E A. Minchin, who has shewn a remarkable aptitude for the discovery of the two latter stages, especially in the family *Lycænidæ* with which this volume deals, nearly all the larvæ and pupæ described therein for the first time having been discovered by him at Barrackpore near Calcutta. Unfortunately for me, he was only able to help me in this way for about a year, after which he left India for Oxford. Colonel C. Swinhoe also has very kindly allowed me the use of his collection of *Lycænidæ*, which is especially rich in species from the Bombay Presidency. Lastly, I have to thank Mrs. Wylly, Messrs. C. G. Blathwayt, E. H. Aitken, G. F. Hampson, J. Davidson, F. Fairlie, E. E. Green, B. Noble, and W. Davison for the gift of many specimens.

To Dr G. King, C I E, the Superintendent, and to Dr. D. Prain, the Curator of the Herbarium, of the Royal Botanical Garden, Calcutta, who have most kindly named most of the plants on which the larvæ described in this volume feed; as well as to Dr. A. Forel, of Geneva, who has carefully named the various species of ants that attend many of the larvæ; my thanks are also tendered.

I propose, immediately after this volume is published, to take up the next, which will contain the family *Papilionidæ*, and I trust that I may be able to finish it in less time than its predecessors have taken.

LIONEL DE NICÉVILLE.

13, KYD STREET,
CALCUTTA. *January*, 1890.

FAMILY 3.—LYCÆNIDÆ. (FRONTISPIECE, PLATES XXV TO XXIX INCLUSIVE.)

Lycænida, Leach, Edinb. Encyc., vol. ix, p. 129 (1815); *Lycænidæ*, Stephens, Illustr. Brit. Ent., Haust., vol. i, p. 74 (1827); id., Westwood, Introd. Mod. Class. Ins., vol. ii, p. 358 (1840); idem, id., Gen. Diurn. Lep., vol. ii, p. 468 (1852); id., Bates, Journ. Ent., vol. i, p. 220 (1861); idem, id., vol. ii., p. 177 (1864); id., Trimen, Rhop. Afr. Austr., p. 217 (1866), idem, id., South-Afr. Butt., vol. ii, p. 7 (1887); id., Moore, Lep. Cey., vol. i, p. 69 (1881); id., Distant, Rhop. Malay., p. 193 (1884). *Erycinidæ* (part), Swainson, Lardner's Cab. Cyc., pp. 86, 94 (1840); *Lycænites* Blanchard, Hist. Nat. des Ins., vol. ii, p. 342 (1845); *Polyommatidæ*, Swainson, Phil. Mag., second series, vol. 1, p. 187 (1827); *Polyommates*, Boisduval, Hist. Gén. des Lép. Amér. Lep., p. 2 (1829); *Euménides* and *Lycéniaes*, id., Sp. Gén., Lep., vol. i, pp. 163, 164 (1836); *Erycinidæ* (part), Swainson, Hist. and Nat. Arrang. Ins., p. 94 (1840); Vermiform Stirps, Horsfield, Cat. Lep. E. I. C., pp. 20, 38, 64 (1828).

"FORELEGS, slender and evidently smaller than the rest, but nearly alike in the sexes, used for walking, scaly; tarsus of the *male* long, exarticulate; that of the female jointed like in the hindlegs. FOREWING, with the subcostal nervure emitting only two, or three [very rarely four] branches; the discoidal cell generally narrow owing to the distance between the costal and subcostal nervures; [the upper disco-cellular nervule wanting]. All but one or two of small size. BODY, rather slender [except in the genus *Liphyra*, Westwood]; *antennæ* short, often ringed with white, with an elongate distinct club; *palpi* [usually] elongate, terminal joint slender, horizontal, and nearly naked. HINDWING, scarcely channelled to receive the abdomen, often with one or more slender tails; præcostal nervure apparently wanting." (*Marshall* and *de Nicéville*, Butt. of India, vol. i, p. 18)

"INSECTS [usually] of small size. BODY, generally comparatively slender. HEAD, moderate-sized, often with a small tuft of hairs at the base of the antennæ. *Eyes* often hirsute. *Antennæ* generally shorter than half the length of the costa of the forewing, often ringed with white, and terminated by an elongated distinct club. *Palpi* [very variable in length, often longer in the female than in the male, extremely short and small in some genera, *i.e.*, *Rapala* and *Liphyra*, very long in other genera, *i.e.*, *Cheritra*, *Drupadia* and allies, and *Loxura*] rather elongate, terminal joint slender, horizontal, nearly naked. *Forelegs* evidently smaller in proportion than the rest, nearly alike in size and shape in the two sexes, not [very rarely] brush-like in the males, but furnished with a long exarticulate tarsus, having several curved hooklets at the tip, distinct from the ungues. Forelegs of the female with the tarsus articulated like the hindlegs. *Hindlegs* slender, scaly; hind tibia with only one pair of spurs, sometimes very minute; ungues minute, scarcely exserted. FOREWING, with two or three branches only [rarely four] to the subcostal nervure. Discoidal cell [closed], generally narrow, owing to the distance between the costal and subcostal nervures; [the upper disco-cellular nervule wanting]; wings closed over the back when the insect is at rest. HINDWING, with the outer margin often produced into one or more slender tails near the anal angle. Abdominal margin scarcely forming a groove for the reception of the abdomen. Præcostal nervure apparently wanting; discoidal cell closed by very slender disco-cellular nervules."

"LARVA, short, broad, flattened [often arched], usually naked, [usually] resembling a wood-louse; head very minute; occasionally finely hairy, or with the surface wrinkled, [rarely furnished with long fleshy tubercles, or with bunches of short bristles; also with certain organs on the eleventh and twelfth segments, that on the eleventh when present exuding a liquid which is probably sweet and always eagerly sought by attendant ants; those *on the twelfth when present consisting of two more or less brush-like protrusible tentacles*, the use of which is uncertain]. PUPA, short, thick, obtuse at each end ; [usually] attached by the tail, and girt by a silk thread across the middle of the body ;" [sometimes suspended by the tail only and hanging quite free as in the family *Nymphalidæ* and most of the genera of the family *Lemoniidæ* ; sometimes the pupa is quite unattached and lies on the surface of the ground, or forms a weak cocoon just below the surface ; very rarely the pupa is almost free and assumes a more or less upright position amongst the stems of its food-plant, spinning a few threads to secure it in position. The pupa is usually naked, sometimes covered with short hairs, or bristles ; sometimes it has bunches of very long hairs, especially on the abdominal region.] (*Westwood*, l. c. in Gen. Diurn. Lep.)

From the preceding diagnosis it will be seen that the organs of primary importance in separating the *Lycænidæ* from the other families of the Rhopalocera are the forelegs.* The differences in these organs are however correlated with those in other structural details, and amongst these the venation of the wings naturally invites study, as offering important points of difference among genera and species in all Lepidopterous groups. Here it will be seen that, while the subcostal nervure of the hindwing resembles that of all the *Nymphalidæ* and the *Libythæinæ*, and two species of the genus *Dodona* of the *Nemeobiinæ*, in giving off its first branch (or first subcostal nervule) before the apex of the discoidal cell, the corresponding nervure in the forewing differs in nearly all the genera of the *Lycænidæ* from those of the preceding families in having less than four branches or subcostal nervules. There are three aberrant genera occurring within the strict geographical limits of this work—*Zarona*, mihi, *Dacalana*, Moore, and *Liphyra*, Westwood—and one in the Malay Peninsula—*Diramas*, Distant—which resemble the *Nymphalidæ* and *Lemoniidæ* in having four subcostal nervules to the forewing (exclusive of the terminal portion of the subcostal nervure often called an additional subcostal nervule) ; and in three other strictly Indian genera—*Amblypodia*, Horsfield, *Iraota*, Moore, and *Zesius*, Hubner,—and one Malayan genus—*Neocheritra*, Distant,—the males have four subcostal nervules, while the females have only three. These variations, however, in the number and arrangement of the subcostal nervules of the forewing do not by themselves serve (as will be shown further on) for defining natural groups in further subdividing the family, though in conjunction with other features they are useful in classification. The *Lycænidæ* differ from the *Nymphalidæ* and *Lemoniidæ* in having no upper disco-cellular nervule to the forewing ; the middle disco-cellular nervule always arises either from the point where the upper discoidal nervule is given off from the subcostal nervure or from the latter vein itself a little beyond its base : the family is also aberrant in lacking entirely the præcostal nervure of the hindwing, which is always found in the previous families.

A very curious structural feature occurs in both sexes of all species of six genera, and in one species of one genus, in that the upper discoidal nervule of the forewing is given off from the subcostal nervure *beyond* the apex of the discoidal cell, the like of which occurs in no genus of the families treated hitherto in this work. These genera are as follows :—*Gerydus*, Boisduval ; *Paragerydus*, Distant ; *Logania*, Distant ; *Poritia*, Moore, one species ; *Zephyrus*, Dalman ; *Euaspa*, Moore ; and *Liphyra*, Westwood. Mr. Scudder shews that this abnormal neural character occurs in one North American species of *Lycænidæ*, the *Feniseca tarquinius* of Fabricius, as I learn from pl. xxxix, fig 24, of his "Butterflies of the Eastern United States and Canada." Mr. W. H. Edwards—erroneously, I think, as it does not appear to possess a præcostal nervure to the hindwing, a distinguishing character in the family *Lemoniidæ*, and has also the subcostal nervure of the hindwing branching *before* the apex of the discoidal cell—considers this butterfly to belong to the subfamily *Nemeobiinæ*.

---

* It will be noted that the *Gerydus* group is abnormal in respect to its legs. It may also be observed that Mr. Roland Trimen states that three genera of South African butterflies—*Deloneura*, Trimen ; *Arrugia* Wallengren ; and *Lachnocnema*, Trimen—have completely articulated and clawed fore-tarsi in the male ; and that in the Indian genus *Taraka* Doherty. MS , the fore-tarsi of both sexes are without articulations, and have the claws basally united Of *Deloneura*, Mr. Trimen writes that it is unique amongst butterflies, in that "it has no middle disco-cellular nervule to the forewing, the upper and lower discoidal nervules having a common origin." This very curious feature is also found in the Indian genus *Iraota*, Moore. The genus *Lachnocnema* is, perhaps, equally aberrant in another way, as the legs (femora, and, especially, the tibiæ,) are clothed with "very long extremely dense woolly hair, hiding basal part of tarsi."

If the subcostal nervules of the forewing be used for the division of this family into primary groups, four such divisions may be formed : (*1*) the first with two : (2) the second with three : (3) the third with three in the female and four in the male : (4) the fourth with four in both sexes. This arrangement, although it would seem at first sight to be natural, as based on structural characters, which in many cases appear to be of real value in forming natural groups, is found in this family to separate some obviously closely allied genera, and to bring together others which do not seem to have natural affinities to one another. It may, however, be of some interest and use to tabulate the groups which would be formed under this system :—

(1)
Neolycæna.
Thecla
Thamala
Hypolycæna
Chliaria
Zeltus
Rathinda
Horaga
Catapœcilma
Drupadia
Tooxylides.
Yasoda
12

(2)
Gerydus
Paragerydus.
Allotinus
Logania.
Poritia
Pseudodipsas
Pithecops
Neopithecops
Spalgis
Taraka.
Megisba.
Lycæna.
Chilades.
Cyaniris.
Zizera
Azanus.
Orthomiella
Lycænesthes
Niphanda
Talicada.
Everes
Nacaduba
Jamides
Lampides
Catochrysops.
Tarucus
Castalius
Polyommatus
Surendra
Apporasa
Thaduka.
Arhopala.
Acesina
Mahathala.
Curetis
Zephyrus.
Euaspa
Chætoprocta.
Chrysophanus.
Ilerda
Arrhenothrix.
Camena
Maneca.
Mota.
Aphnæus
Tajuria
Suasa
Charana.
Cheritrella.
Neomyrina.
Ticherra
Cheritra.
Biduanda
Loxura
Drina
Lehera.
Araotes
Deudorix.
Zinaspa
Hysudra.
Rapala
Bindahara.
Virachola
Sinthusa
64

(3)
Amblypodia.
Iraota.
Zesius.
3

(4)
Zarona
Dacalana.
Liphyra.
3

From the above list it will at once be seen that the separation of the *Nymphalidæ* and *Lemoniidæ*, with their four-branched subcostal nervure, from the *Lycænidæ*, as possessed of less than four subcostal nervules, holds good generally; in eighty two Indian genera only six genera forming exceptions. These six genera, however, are manifestly aberrant, five of them being slightly abnormal offshoots of normal Lycænid groups, while the sixth, *Liphyra*, is altogether peculiar, and scarcely finds a suitable location in this family of small and delicate insects from which it is separated by its comparatively large size, robust and short body, stout antennæ, and thick and moth-like texture of wing with large loosely-attached scales. I may add that I have devoted especial and careful study to the neuration of the wings of this family, and have tested the diagnoses of all its genera by microscopic examination of bleached and mounted specimens of the wings of both sexes of one or more species in each genus whenever procurable, often sacrificing unique specimens in my collection for this purpose. All variations in neuration have been utilized in discriminating genera, species, and sexes, and in constructing the "key," but, as already observed, the differences in neuration, though considerable and numerous, do not offer characters which are universally and constantly applicable for primary divisions, and they are consequently of only secondary value in the classification in this family.

After the veins, it is probable that the caudate appendages or "tails" with which so many of the *Lycænidæ* are furnished are the next most important structural characters to be observed in the wings. In this there is very great diversity; many genera possess no tails whatever; two genera of Indian *Lycænidæ* (*Nacaduba* and *Arhopala*) possess some species which are tailed, others which are tailless; two genera exist (*Megisba* and *Nacaduba*) in which I believe the same species to be furnished with, or sometimes to lack, a single filamentous tail to each hindwing. Numerous genera have one short tail, others have two short tails, others again have two tails of different length, and sometimes it is the inner one, sometimes the outer one, which is much the longer; lastly, some genera have three tails and in these the middle tail is usually the longest. The number of the tails is variable in the sexes also *Iraota* and *Surendra* have one tail in the male, two in the female, while *Zesius* has two tails in the male, and three in the female. In the genera *Thamala, Lehera*, and *Araotes*, the males have one short tail, which is greatly elongated in the female The length and breadth of the tail is as variable as its presence or absence, or the number found in one wing. In *Lycænesthes* the tails appear to be three in number, but these are very minute, and are nothing more than a few cilia which are rather more elongated than the rest, and are very liable to be broken off or otherwise destroyed In a very large number of genera the tail is only about an eighth of an inch in length, and filiform; in a few genera it is very long indeed, a full inch in length comparatively broad, and highly ciliated; while one genus (*Zeltus*) has two such tails to the hindwing, one of which is, however, much shorter than the other There is almost every gradation amongst Indian *Lycænidæ* between those species with the shortest and those with the longest tails. In the species with long tails, it will often be found that the tails are twisted at the ends. No other family of butterflies can shew such diversity of tails as can the *Lycænidæ*.

The "anal lobe" of the hindwing is usually an important structural character, some genera lack it altogether, some have it very small, while others again have it very large it perhaps reaches its greatest development in the genus *Bindahara*, lastly, the genus *Arhopala* shews no trace of it in some species, has it very small in others, and moderately large in others again.

It is thus manifest that, in the "caudal" and "lobular" appendages of the hindwing, the *Lycænidæ* offer very variable features, which might be expected to offer characters of primary importance, and to a considerable extent this is so, the presence and absence of tails, their length, form, &c, serving to separate really natural groups. Here again however, we must allow for many deviations from a strict uniformity in genera and in the characters appertaining to groups, and such deviations must be admitted as occasional, and really unimportant aberrations In combination with these appendages, the general form and the outline of the hindwing must be studied as these also, though not perhaps susceptible of very close and minute definition, appear to be generally constant in the main groups, and on these Mr. Distant has relied for the determination of two out of three of his divisions of the *Lycænidæ* in his magnificent "Rhopalocera Malayana,' viz —

Posterior wings without filamentous tail like appendages near the anal angle . CURETARIA.
Posterior wings with minute filamentous or prominent tail-like appendages near the anal angle . .. .
  Posterior wings convex, about as broad as long ... . CASTALARIA.
  Posterior wings more or less elongate, distinctly longer than broad ... ... APHNARIA.

I should have been glad to have adopted these primary divisions, but am unable to do so as they are mainly based on the presence or absence of tails to the hindwing, and, as I have shewn above, three Indian genera, which also occur in the region treated in Mr. Distant's work, viz, *Megisba*, *Nacaduba*, and *Arhopala*, have both tailed and tailless species

In the divisions or groups adopted in this work, the form of the hindwings has been utilized, as correlated with the style of the caudal appendages and with other structural features, and has been found to help in marking natural groups, and forming a natural sequence, which is generally in accord with that adopted by Mr Distant. The *Gerydus* group ha short rounded hindwings without tails; the *Poritia* group has rather produced hindwings and no tails, the species being often very brilliantly coloured on the upperside of the male; the tailless "Blues" or *Lycæna* group have short hindwings, of which the outer margin and anal angle are entire and smoothly rounded; the tailed "Blues" or *Polyommatus* group differ only in the possession of a short and delicate filamentous tail at the end of the first median nervule; the *Amblypodia* group presents a more or less elongated form of hindwing with some variety in the shape and caudation; the *Thecla* group has also elongated hindwings, often considerably produced posteriorly and showing a tendency to a lobe, in addition to their one or two tails, this group being the largest, and containing a very heterogeneous collection of genera, the *Myrina* group differs from the proceeding in having two very long ciliated tails with a well formed anal lobe; the *Horaga* group is a small coterie of genera with hindwings shaped much as in the last but provided with three short tails; the *Loxura* group contains only two genera, which have a greatly produced hindwing ending in a very long tail curled at the end; the *Deudorix* group has a produced and elongated hindwing, usually with a well-formed anal lobe, and one tail, which is very variable in length, many of the genera being further noticeable for possessing in the males, on the upperside of the hindwing below the costa, a curious impressed scale-shaped or "blister like" sexual mark. The genus *Liphyra* stands distinctly apart in almost every character from the rest of the family.

The secondary sexual characters (often called "sex marks," "scent-organs," "male-marks," &c.) which are found in many different positions and of very variable structure and nature on the wings of male butterflies of the *Lycænidæ*, are of high interest, and have been carefully noted by me in the diagnoses of the genera which follow. Dr. Erich Haase has devoted considerable attention to "The Scent Apparatus of Indo-Australian Butterflies," and in Iris, vol. i, p. 316, *et seq.*, gives a description of some of these structures as occurring in the *Lycænidæ*. The androconia or "battle-door scales," which are found scattered amongst the ordinary scales on the wings of male butterflies, require to be carefully searched for and to be examined under a microscope. These I have not studied, but they doubtless occur in a very large proportion of the species. The secondary sexual characters to which I more particularly refer are considerable patches of scales which are quite differently formed from those of the rest of the wing, and tufts of long hairs which are placed in very diverse positions, both of which can be easily seen with the naked eye. I refer the reader to detailed descriptions of these in their proper place, and I give below a list of the Indian genera of *Lycænidæ* in which they are found.—

On the forewing only.	*On the hindwing only.*	*On both wings.*
Iraota	Poritia	Dacalana
Thecla	Maneca	Arrhenothrix
Thamala	Cheritra.	Camena
Hypolycæna	Biduanda.	Drupadia.
Horaga (some)	Yasoda	Rapala
Eooxylides	Hysudra.	Bindahara.
		Virachola.
		Sinthusa

These genera may again be arranged with reference to the structure of these secondary sexual characters, also as to the genera possessing one or both characters, thus.—

With peculiarly formed scales only	*With long tufts or pencils of hairs only*	*With both patches of scales and tufts of hairs.*
Thecla	Poritia	Dacalana
Maneca	Iraota	Arrhenothrix.
Thamala	Cheritra	Camena.
Hypolycæna		Rapala
Horaga (some)		Virachola
Biduanda.		Sinthura.
Drupadia		
Eooxylides.		
Yasoda.		
Hysudra		
Bindahara		

The other more important organs, such as eyes, antennæ, palpi, &c., though varying to some extent in the several genera of this family, do not offer striking characters for classification or for special notice, though they will be referred to in the diagnoses of the different genera. The eyes are notched on the inner margin to give room for the sockets in which the bases of the antennæ are inserted; they do not rise above the general contour of the surface of the head; they are sometimes quite naked, sometimes have a portion at least of their surface sparsely covered with short exceedingly delicate hairs; the use of these hairs is quite unknown. The antennæ, including the club, are straight, usually formed of very distinct white-ringed joints. The antennæ are very variable in length, in many Indian genera they are considerably less than half the length of the costa of the forewing; in the majority they are about equal to half the length of the forewing, in very few are they more than half the length. The club of the antennæ is most variable; in the majority of the genera it is well-formed, in *Amblypodia* there is hardly any thickening towards the apex of the antennæ however, and in many others the swelling is very slight and gradual. The antennæ do not seem to serve to separate groups with sufficient exactness, though the *Amblypodia* group are generally characterised by short antennæ, gradually incrassated from base to tip without a distinct club. The palpi are perhaps even more variable than the antennæ. They are smallest of all in *Liphyra*, very small indeed in *Rapala*, then gradually increasing in length till a maximum is reached in *Loxura* and *Yasoda*. They often vary in length in the sexes; when this is the case, they are always longer in the female than in the male. The maxillæ or haustella of the *Lycænidæ* are very short; as a rule the butterflies do not live much on the honey of flowers, so have no use for a long trunk.

The larvæ and the eggs of the *Lycænidæ* are distinctive, and their special forms, &c., correlated to the peculiar features of the imago, denote the reality of the *Lycænidæ* as a well-defined and separate family of the Rhopalocera, though some species of the *Lemoniidæ* are obviously closely allied to the *Lycænidæ* in all stages; indeed Mr. S. Scudder unites the two families as I learn, from the first parts of his most exhaustive and magnificent work, "The Butterflies of the Eastern United States and Canada," which have just reached me. It is probably in the characters of the earlier stages of the *Lycænidæ* that success in a thoroughly satisfactory classification of the family may best be sought; but the materials at our disposal are not yet sufficient for this to be attempted at present. In the order in which I have arranged the Indian genera, I have striven to place them in as natural a sequence as possible, judging from the *facies* and structure of the imagines, but I am painfully conscious that my efforts in this direction have only met with partial success.

Mr. W. Doherty, who has devoted much time and attention to the study of the eggs of butterflies, has divided the family *Lycænidæ* into several subdivisions, chiefly based on their structure, the diagnoses of which I give below:—

"LYCÆNIDÆ.—Eggs hard, small, numerous, much wider than high, reticulate, with a whitish, calcareous (?) accretion, forming an asymmetrical network of tetragons."

"Subdivisions of the *Lycænidæ*."

"*Amblypodinæ*.—Egg at least half as high as wide, convex above, widest well above the base, with numerous delicate intersecting ridges bearing acute spines at their crossing."

"*Deudoriginæ*.—Egg similar, with short truncate spines."

"*Theclinæ*.—Egg fully half as high as wide, convex above, widest close to the base, with coarse, minutely vesicular reticulations, forming large irregular pits over the surface, and bearing broad, depressed tubercles at their intersection."

"*Lycæninæ*.—Egg less than half as high as wide, concave above, "turban-shaped" (as Mr. Scudder calls it), widest above the middle, reticulations coarse and asymmetrical."

"*Poritinæ*.—Egg hexahedral, otherwise similar. This is the only egg known to me that is not round in horizontal section."

"*Gerydinæ*.—Egg less than one-third as high as wide, delicately and sometimes obsolescently reticulate, sometimes carinate, flat above and below." (*Doherty*, Journ., A. S. B. Vol. lv, pt. 2, p. 110, 1886.)

I have often examined the eggs of several species of *Lycænidæ* under the microscope, and realized what beautiful objects they are ; but in a very few cases only have I made detailed descriptions of them, and my investigations in this direction are insufficient to enable me to form groups based on the structure of the egg.

Mr. Scudder states that "tiarate or echinoid eggs are confined to and include all of the *Lycænidæ*, but in one genus, *Heodes*,* the base of the egg is broadened to such an extent that it is only by sufferance that it can be classed here ; it is rather demi-echinoid ; the surface of tiarate eggs is nearly always broken up into cells of varying size separated by distinct heavy walls, which are sometimes of uniform height throughout, at others produced at the angles into tubercles presenting, on close examination, a very different effect." (Butt. of the East. U. S., p. 3.) "The tiarate eggs are very beautiful objects, often reminding one of a miniature sea-urchin without spines, and are characteristic of the *Lycænidæ*, though some of them incline towards the hemispherical form, and all, without exception, are reticulate. In these the surface is never ribbed, but generally covered with a heavy network of deep pits, whose bounding walls are rather coarse and rough. The eggs of the Parnassians [a genus of the *Papilioninæ*] resemble them closely." (l. c., p. 191.) He also notes that the *Lycænidæ*, alone amongst butterflies, as far as is known, sometimes pass the winter in the egg state, the eggs being laid, not on the leaves or very young shoots, as is usually the case in butterflies, but on the stem of their food-plant or in some crevice in the bark.

Mr. Trimen (South-African Butterflies, vol. ii, p. 10) describes the larvæ of the *Lycænidæ* as follows : "Shaped like wood-lice [onisciform] for the most part, are extremely sluggish, and look in many cases more like a *Coccus* or some vegetable excrescence than caterpillars. Some of them are smooth, many clothed with a short down, some with fascicles of short bristles or regularly-disposed tubercles, and a few hairy generally. Several are regularly corrugated dorsally, and others prominently humped in one or two places." The larva of the genus *Spalgis*, Moore, is most aberrant, being furnished with long irregular divergent processes or tubercles ; while the genus *Rathinda*, Moore, has a very similar larva, but the tubercles appear to be arranged more regularly, while some are much shorter than others. The genus *Curetis*, Hübner, has a larva quite *sui generis* : it is anteriorly somewhat humped, and the twelfth segment is furnished with two long upright hollow cylindrical processes or "pillars," from which, at the will of the animal, can be thrust forth long tentacles, of which more will be said further on. Some larvæ of *Lycænidæ* are scutate, being furnished with a hard flattened shield on the dorsal region of the three last segments, which is used by the larvæ to plug up the holes in the fruits on the interior of which they live. Doubtless, hereafter other curious forms of larvæ of this family will be found ; up to the present the transformations of comparatively few species are known. The majority of them feed on the young leaves, buds, and flowers of trees, bushes, and low-growing plants ; three genera—*Lampides*, *Virachola* and *Deudorix*—of Indian *Lycænidæ*, however, feed on the interior of fruits of several different kinds ; lastly some feed upon the seed-pods of leguminous plants ; these latter larvæ have very long necks, so that they can reach far into the interior of the pods with their mouths and thus scoop out the contents, while the greater portion of their body remains outside.

Some species of *Lycænidæ* larvæ are furnished with certain organs which are found in no other larvæ of Lepidoptera as far as I am aware. These organs are certainly not found in all *Lycænidæ* larvæ, but why some species should be so furnished, while others are not, I can offer no confident opinion. I have, however, a theory that these organs exist for the protection of the larvæ, and that, where they are absent, other means of protection exist. In the genus *Curetis*, Hübner, I have found that the larvæ are furnished with one set of organs mentioned above, which are extremely large and well-developed, being

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* The species that Mr. Scudder includes under this genus have hitherto always been considered to belong to the genus *Chrysophanus*, Hübner.

larger than in any other *Lycænidæ* larvæ known to me, while the third organ described below is entirely absent. This latter organ consists of an oval opening on the dorsal line of the eleventh segment with lips like a mouth; these lips can, at the will of the larvæ, be somewhat protruded, and a drop of sweet liquid exuded. On the twelfth segment are two other organs, one on each side, in the subdorsal region. In *Curetis*, which does not possess the mouth-like organ on the eleventh segment, these two organs are of very great size and are much more developed than in any other *Lycænidæ* larvæ known to me. Each organ consists of a tall "pillar" as described above from which, when the larva is touched or frightened, is instantly protruded a long tentacle furnished at its head with a brush of long parti-coloured hairs as long as itself; these hairs open out into a rosette, and the tentacle is whirled round with immense rapidity producing a most curious effect. I believe the *Curetis* larvæ use their tentacles solely to frighten away their enemies, the worst of which are Ichneumon flies. I think it probable that these organs were first developed, and the mouth-like opening on the eleventh segment came into existence at a later date. This latter organ with its sweet-tasting liquid exudation is greatly affected by ants of very many different species, who in return for the food they obtain from the larvæ act as their most efficient guardians. I have found as many as four species of ants attending one species of larva. Ant-tended larvæ are most easily found by looking for the ants; the larvæ are usually coloured like the leaves, buds, flowers, and seed-pods on which they feed, and are for other reasons not easily seen, but the restless red or black-coloured ants are very conspicuous. *Curetis* larvæ are not attended by ants and have not the organ on the eleventh segment, whence the necessity of having the organs on the twelfth segment in a highly developed condition. In other larvæ which are attended by ants the organs on the twelfth segment are smaller than in *Curetis*, and are, I believe, gradually aborting, because, as far as I can see, the ants having constituted themselves their defenders, there is no further use for them for defence, but Mr. Edwards possibly correctly surmises that in their aborted condition they serve as signals to the ants to examine the eleventh segment for the sweet fluid to be emitted by the larvæ. M. Guenée, in 1867, appears to have been the first* to discover these organs, which he found in *Polyommatus bæticus*, Linnæus, and he described and figured them. But little notice was taken of the discovery till Mr. W. H. Edwards rediscovered them and, in "The Canadian Entomologist," vol. x, p. 1 (1878), gave a long account of the organs as found in *Lycæna (Cyaniris) pseudargiolus*, Boisduval and Leconte, a North-American butterfly, with a woodcut of the posterior end of the larva. This account he greatly supplemented in the second volume of his superb work "Butterflies of North-America," in which much additional information is given. Mr. W. Doherty (Journ. A. S. B., vol. lv, pt. 2, p. 112, 1886) has recorded some interesting observations on the same subject, as also has Mrs. Wylly (Journ. Bomb. Nat. Hist. Soc., vol. iii, p. 164, 1888). Not only do the ants attend the larvæ from their very first and smallest stages (I have found ants attending larvæ of *Rapala schistacea*, Moore, only an eighth of an inch long) till they are full grown, but they often cause the larvæ to change to pupæ within their nests, in this manner protecting them from harm from the time they emerge as minute caterpillars from the egg to the hour they assume the perfect form and fly away. Indian collectors should devote at least some of their time and attention to finding out and recording the transformations of the *Lycænidæ* especially, and should note if the larvæ are attended or not by ants, and, if so, by what species of ants; also whether or no they possess the special organs described above. The tentacula or osmeteria found on the second segment in the dorsal line in all larvæ of the subfamily *Papilioninæ* appears to be used for the same purpose, *viz.*, to frighten away enemies, as are the exsertible organs present in some *Lycænidæ* larvæ on the twelfth segment as above described. In the *Papilioninæ*, however, they appear to be scent organs or osmeteria as well.

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* Since the above was written I find that Mr. Scudder writes: "These curious appendages [on the twelfth segment] were first observed by Petzhold, and the attraction to ants of the central gland found upon the segment in front was first noted by Esper." (Butt. of East. United States, p. 15.)

Whether this is the case or not with regard to the somewhat similar organs in the *Lycænidæ* is unknown to the writer. Mr Doherty calls them "scent-glands."

The pupæ of the *Lycænidæ* are usually attached by the cremaster, (which forms the terminal portion of the pupa, and is furnished with minute hooks for attachment to the pad of silk previously spun for that purpose by the larva), and by a silken girth round the middle of the body to whatever surface the larvæ choose on which to perform their transformation. Though this is the general rule, there appear to be many exceptions. Mr. Moore, in his "Lepidoptera of Ceylon," shows the pupæ of *Spalgis epius*, Westwood, and of *Tajuria longinus*, Fabricius, freely suspended by the tail, which is the position assumed usually in the families *Lemoniidæ* and *Nymphalidæ*. This is also the position assumed by an Assamese species of *Poritia*, a pupa-skin of which Mr W. Doherty has recently shown me.* The anal segments in this pupa are strongly curved, so that the main axis of the pupa is parallel to that of the leaf to which it is attached, and the pupa is not girt by a silken band. Mr Trimen notes the same thing, remarking that the pupæ of some *Lycænidæ* are "attached by the tail only in a fixed horizontal or slightly inclined position." Still further, as I gather from the late Mr William Buckler's work on "The Larvæ of the British Butterflies and Moths,' certain pupæ of British Blues and Hairstreaks in confinement are quite free, and are not even suspended by the tail. Mr Buckler notes of the pupa of "*Polyommatus*" *alsus*: "Neither suspended by the tail nor had it any silken cincture;" presumably it changed from a larva to a pupa on the surface of the ground. This would not be improbable, as Mr Buckler's specimens remained in the larval state from the middle of one June till the beginning of the following June, the pupal state lasting some two or three weeks. If the facts are as recorded, the transformations of this species are, as Mr Hellins remarks, "very remarkable." The larvæ of "*Polyommatus*" *adonis*, *P. ægon*, *P. agestis* (*medon*), var. *artaxerxes*, and "*Thecla*" *quercus* are said by Mr Buckler to form a more or less weak cocoon, or to spin a few threads between the stems of their food plants, amongst which they change to pupæ, and to be slightly attached by the tail or to be entirely free. Mr Trimen also notes that the pupæ of some *Lycænidæ* are hidden in the ground. This is certainly true in the case of some Indian species, the larvæ of which are attended by ants, as the latter drive the larvæ into their (the ants') nests, where they turn to pupæ in the usual way, being attached to the trunk of the tree by the tail and a girdle, the ants having constructed a temporary nest around the base of the tree.

There is a very great uniformity in the shape of the pupæ of the *Lycænidæ*, they seem never to be furnished with spines or processes, though they are often densely covered with short hairs or bristles, and Mr Trimen (South African Butterflies, vol. i, pl. ii, figs. 2, 2*a*) figures the pupa of a very aberrant species, *D'Urbania amakosa*, Trimen, as having its posterior end especially most densely covered with very long hairs giving the pupa a most singular appearance. This also is the case in one Indian species of *Poritia*, a pupa case of which I have seen. The pupæ are usually very blunt and much rounded anteriorly, the thorax rounded and often humped, behind this the body is somewhat constricted, the abdomen being convex and ending in a more or less blunt point. The posterior surface is especially flattened, being strongly appressed to whatever object (usually a leaf) on which the insect performs its transformation. The pupæ are generally dull coloured, of various shades of red or brown, some are green; and I know of none that are brilliantly coloured or furnished with golden spots as in so many of the *Nymphalinæ*. The pupa of *Curetis* is as abnormal as its larva, being pale green, almost half a hemisphere in shape, with a short projection at one end, and looks very like a lump of jelly.

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* This apparently unnatural position, as it seems to defy gravity, is assumed also by the pupæ of the genus *Cirrhochroa*, Doubleday, of the subfamily *Nymphalinæ*, one species *C. cognata*, Moore, is so figured in the "Lepidoptera of Ceylon," and I possess a pupa shell of another species, *C. aoris*, Doubleday and Hewitson, from Sikkim, both of which exhibit this peculiarity very markedly. Mr Scudder says, that, in the case of *Cirrhochroa*, and, to a certain extent *Chlosyne*, Doubleday, "the pad of silk is so tightly woven to the surface upon which it is spun, and the cremastral hooks of the chrysalis are spread over so long a surface that the chrysalis, instead of hanging freely, lies with its ventral surface in close proximity to the surface of rest." (Butt. of East United States, p. 122.) In South Africa, Mr Trimen says that two genera *Jolaus*, Hübner, and *Myrina*, Fabricius, have the pupæ attached by the tail only, horizontally usually on the underside of a leaf, or to a twig

Most fortunately in the imagines of the *Lycænidæ* the markings of the underside of the opposite sexes are usually the same, otherwise, owing to the very great diversity which usually obtains in the markings and coloration of the upperside in the males and females, it would be almost impossible in many cases to correctly pair the species The females are almost always much duller coloured on the upperside than the males, dull browns and black frequently prevailing The general coloration of the males is usually some shade of blue or purple, but many other colours are found, red and yellow being common, green very rare, that colour being still less frequently met with on the underside It is found in the European *Thecla rubi*, Linnæus, the "Green Hairstreak," and in the Indian *Lehera eryx*, Linnæus Green is, I believe, never found on the upperside of females in the *Lycænidæ* In size the *Lycænidæ* include the smallest known butterflies, some species expanding less than half an inch when the wings are wide outspread The majority of the species are about an inch in expanse, while a few reach two inches, which may be considered to be a large size One Indian species, *Liphyra brassolis*, Westwood, is as aberrant in size as it is in other characters, being the only known species of the family which exceeds three inches in total expanse. As a family, the *Lycænidæ* are remarkable for their often excessive abundance in individuals, in this respect outnumbering any other family, and for their extensive range over the earth's surface, as they occur in the coldest and hottest regions, and often reach the highest mountain altitudes. Their colouring is also often most brilliant, metallic shades of green and blue are found almost equalling the glories of the South-American *Morphos* on a small scale The patterns of the undersides are often most intricate and involved, metallic spots frequently abounding With regard to the habits of the *Lycænidæ* a very large proportion of them are found in open meadow or grass land, this being especially the case in temperate climates A good many species in the tropics are also found in similar localities, but by far the greater number frequent trees and bushes, especially open spots or paths in forests and overhanging trees by road sides. As usual the rich forests which clothe the slopes of the Himalayas, especially to the eastwards, produce the greatest number and most beautiful species, this being especially the case at an elevation of from two to four thousand feet. The males of most of the *Lycænidæ* are particularly fond of sucking up the moisture from the damp sandy sides of hill streams, hence that sex is by far the commoner in collections; the females probably fly much less than the males and keep more to the jungles, settling on trees and bushes where they are difficult to follow and to catch All the butterflies of this family have the habit, when first settled, of rubbing the hindwings one over the other, the motion being apparently more or less rotary. Mr. Trimen notes on the subject "This curious habit is practised by every member of the family that I have watched when settled, and it seems not improbable—looking to the brilliant eye-like metallic spot and (very often) adjacent tail or tails at the posterior angle of the hindwing of these butterflies—that the movement may serve to accentuate these ornaments, either in rivalry or in menace" (South-African Butterflies, vol 1 p. 30, footnote.) Mr Scudder thinks that the action may cause a stridulation, which, though inaudible to our ears, may be heard by insects. The habit of closing the wings when at rest amongst the *Lycænidæ* is by no means universal, large numbers rest with wings fully expanded or half open to show off the brilliant colouring of the upperside The more robustly-constructed *Lycænidæ* have an extremely rapid flight, so fast indeed that the eye can hardly follow them; but these flights are not usually of long duration or for any great distance, the butterflies soon settle again The species which live amongst the grass have usually a weak flight and are easily caught These latter embrace what are called in England the "Blues" Of quite a different habit are the "Hair-streaks;" they have a rapid flight, and hardly ever settle on the ground, being almost always found on bushes or low trees They seldom come to flowers, and to discover them it is often necessary to beat the trees or bushes affected by them to make them fly. The great Oriental genus *Arhopala*, Boisduval, amongst others, can only be caught in this way, even the males never seem to go to water, nor does either sex visit flowers. The genus *Chrysophanus*, Hübner, the species of which are called "Coppers" in England, are mostly found in meadows, and have a short jerky rather quick flight. In India they occur only in the Western Himalayas.

Sexual dimorphism does not appear to obtain to any great extent in the *Lycænidæ*, though in the genus *Zephyrus*, Dalman, Mr. J. H. Leech records that one Japanese species, *Z. japonica*, Murray, has four distinct forms of females with numerous intergrades between them. In India I do not know positively of any species of *Lycænidæ* that is sexually dimorphic, though I strongly suspect that this phenomenon occurs in *Zephyrus birupa*, Moore, one form of its female having been described as a distinct species under the name of *Z. ziha*, Hewitson.

Seasonal dimorphism obtains to a very great extent, but has hitherto remained quite unrecognised in the Oriental region. Mr. W. H. Edwards in North America has worked out the subject fully with regard to *Lycæna* (*Cyaniris*) *pseudargiolus*, Boisduval and Leconte, which not only has distinct winter, spring, and summer forms, but has local races also which have developed seasonal forms of their own. In India the seasonal forms seem to be chiefly restricted to two, a wet and a dry, but in Sikkim the dry-season form which occurs at the end of the year differs somewhat from the dry-season form which occurs in the spring, so that with regard to some species there may be said to be three forms—a spring, a wet-season, and a winter form. Seasonal dimorphism, according to my own observations, occurs in India in the genera named below, but I feel sure that if collectors would devote a little time and attention to the matter, many other hitherto unexpected facts of this nature would be discovered.

Genera of Indian Lycænidæ in which seasonal dimorphism occurs.

Neopithecops.
Taraka
Megisba.
Chilades.
Cyaniris.
Zizera.
Niphanda.
Everes
Nacaduba.
Lampides
Catochrysopa.
Castalius.
Aphnæus.
Ticherra.
Cheritra.
Horaga.
Loxura.
Yasoda.

Mimicry amongst the *Lycænidæ* is a subject which I believe has never been broached, though doubtless it occurs to a considerable extent. Unfortunately, I have not studied the matter, and I can give no facts of my own observing. Mr. W. Doherty, who is, I believe, the only one who has made any researches in the matter, has given me the following table. It must be remembered that the mimicry is shewn by the markings of the underside, the butterflies requiring protection when at rest :—

Protected genera.	*Mimicking genera.*
Neopithecops, Distant. *Pithecops*, Horsfield	Mimicked by a *Cyaniris*, Dalman, and a *Logania* (*substrigosa*, Moore)
Eooxylides de Nicéville. *Yasoda*, Doherty, MS. *Loxura*. Horsfield.	Mimicked by Mr. Doherty's division *Theclinæ*, as for instance *Eooxylides tharis*, Hübner, by *Neocheritra gama* Distant
Drupadia, Moore. *Biduanda*, Distant	Mimicked by *Araotes*, Doherty, MS., possibly by *Poritia* Moore, and by the *Theclinæ*
Cyaniris, Dalman, of the group of *cœlestina*, Kollar. Probably several species are more or less protected ...	Mimicked by *Chliaria*, Moore, and some species of *Tajuria*, Moore.
Lampides ælianus, Fabricius (possibly) and *L. elpis*, Godart (probably) with its allies and representatives. ...	Mimicked by species of the genus *Arhopala*, Boisduval.

With regard to protective resemblance, which is akin to mimicry, Mr. Pryer makes the following interesting remarks :—" The upper and undersides of the wings [in the *Lycænidæ*] are utterly different, presenting a startling contrast. This is of great service to them as a protection from their numerous enemies. I have often watched a dragon-fly attempt to catch one of the Blues, but never saw a capture made; when in flight the Blue at a distance presents only the impression to the eye, of a blue substance moving along irregularly, but if viewed closer the rapid irregular flight of the insect brings alternately into view, greyish-white and blue (or brown in the female). The dragon-fly makes a succession of dashes at his prey, which, if hard pressed, will settle with closed wings, presenting an entirely new appearance.

when the baffled pursuer almost invariably abandons the chase." ("Rhopalocera Nihonica," p. 20.)

In forming a tabular index in linear order of the species of any family of the animal or vegetable kingdoms, it must be distinctly realized that any linear arrangement must be more or less artificial, and most naturalists will admit that the relationships between species can be most truly and naturally represented in the ramifications of a genealogical tree: or that allied groups touch one another, so to speak, at several points, or show affinities on different sides and in different directions; so that, when placed in a linear series, though in contact with genera and species to which they are manifestly related, they must be separated from others which appear also to be their allies: and that in attempting to form naturally continuous sequences there must be interpolations of more or less aberrant forms which mar the perfect continuity.

In the selection of characters to serve as indices of primary or secondary importance in determining groups, no certain law or rule can be, or at any rate has yet been, adopted.. Characters which serve in one order or family as of primary value are of only minor importance in another, nor can any one organ or character be arbitrarily selected of more classificatory value than another. The number and arrangement of pistils and stamens in the vegetable kingdom might naturally have seemed to Linnæus to be correlated with structural differentiations of primary value; but further botanical research has shown that this is not the case, and that a natural order seems to depend on combinations of numerous and varying characters In the *Coleoptera* certainly it so happens that the articulations of the tarsus are so correlated with differences of habit and structure as to serve by themselves as characters of primary importance; but such pre-eminence of a single character is unusual in natural history. In studying the Indian *Lycænidæ* no single character seems to serve as a really satisfactory and constant guide for forming well-defined groups; and it must also be borne in mind that no grouping, based on a study of the *Lycænidæ* of a restricted area, can be expected to serve for the classification of the whole of this family as spread over the earth's surface; and that therefore any classification of Indian species only can be but provisional, though perhaps serving as a useful aid to future workers in a larger field.

In seeking for some one structural feature whereby to define the primary groups, if not rigidly, yet sufficiently for the purposes of the Key, the subcostal nervules of the forewing may seem to offer suitable characters. The number and position of these nervules give much assistance in determining the relationship of genera and species in some families, but, as pointed out by Mr. Hewitson ("Illustrations of Diurnal Lepidoptera"—*Lycænidæ*), these characters differ even in the sexes of the same species in some of the *Lycænidæ*. Such instances are however but rare, and if these be treated as abnormal deviations from general rules, the arrangement of these nervules can be utilized as characters of, at any rate, secondary or tertiary value in classification. Thus, if adopted as primary characters, they will be found to separate *Thecla* far from *Zephyrus*, *Euaspa*, &c.; *Yasoda* from *Loxura*; *Lycænesthes* from the tailless "blues"; *Amblypodia* from *Arhopala*, &c. If however the arrangement of these nervules fails to define the limits of primary groups they may be usefully employed as minor characters.

In discussing these nervules it seems necessary *en passant* to point out that in this work the view, advocated by Westwood and adopted in the introduction of this work (*vide* vol. i, pp. 11, and 17), as to the subcostal nervure being continued to the margin of the wing after throwing off 2, 3 or 4 nervules only towards the costa, is constantly maintained. Mr. Distant regards the terminal portion of the nervure as an additional and last nervule, and then he notes, 3, 4, and 5 nervules in the cases where only 2, 3, or 4 are specified in this work; this is of course only an apparent discrepancy; and it is really of no importance which view is maintained, so long as the student realizes the system adopted in the work which he is consulting. Mr. Moore in the "Lepidoptera of Ceylon" often treats the upper discoidal nervule (as defined in this work, and by Westwood, Distant, and most entomologists) as a subcostal nervule; so that his descriptions in respect to the number of these nervules are still more in (apparent) disagreement with those in the following pages.

In looking for some other feature whereby to define main groups, the filamentous appendages which often appear on the hindwing naturally suggest themselves. These "tails" however are sometimes somewhat uncertain characters, as genera occur in which obviously very closely related species differ *inter se* in the presence or absence of these delicate filamentous appendages; in fact it would appear that the same species (*e.g.*, *Nacaduba ardates* and *Megisba malaya*) may have both tailed and tailless forms. Regarding, however, such deviations from the ordinary type as occasional and abnormal only, the presence or absence of tails, their number, form, and size, seem to serve better than any other single structural feature as characters uniting naturally allied groups; and as such they are used as of primary importance in the following table.

Here however it should be recognized that the importance of this character, as of any other, must not be exaggerated: nor must it be assumed to be perfectly constant. The classifier is apt to become more or less a slave to his system, and to attach too strong a value to his characters: thus he is inclined to say that one species certainly strongly resembles another, but that the resemblance can only be superficial, as the first has three and the second only two subcostal nervules in the forewing; whereas the fact perhaps may be that the manifest resemblance is real and betokens true affinity, while the structural difference in respect to the subcostal nervules may be really unimportant, having a value more or less fictitious, and dependent only on the classifier's arbitrary and artificial system.

With these reservations as to real value and constancy of the characters used in the following table, and as to the artificial nature at the best of any linear "index methodicus," it may be claimed that this Key seems to bring together insects which are naturally allied. A general consensus of collectors and students seems to recognize as real and natural groups the true tailless "blues," tailled "blues," and "hairstreaks"; or alliances, of which *Poritia* *Lycæna*, *Polyommatus*, *Amblypodia*, *Thecla*, *Myrina*, and *Deudorix* represent the main types. It is really immaterial with which group the series commences or ends; nor, for reasons already given, does it seem possible to place each group so that it shall fit exactly and truly between those which precede and follow. It will be seen that at one end stands the *Gerydus* group with abnormal tibia or tarsus, and with apparent affinities to Geometers or other delicate *Heterocera* at the other *Liphyra*, of which the stout build and other characters suggest relationship to the *Nymphalinæ* among butterflies and *Castniadæ* among moths. Between these lie the normal *Lycænidæ*, commencing with the brilliantly coloured *Poritia* group; then follow the tailless "blues" or *Lycæna* group, with their short and round hindwings, passing into the closely allied tailed "blues" with very similar hindwings, the *Polyommatus* group; these pass into the *Amblypodia* group, whose hindwings are normally less round, and are more produced and sometimes lobed, varying much in respect to the single tail, which is generally much stouter than in the preceding group, but is sometimes filamentous, and indeed occasionally obsolete. These blend with the Coppers and Hairstreaks, the *Thecla* group, with one or two tails and more elongated hindwings, and pass naturally into the Hairstreaks with two or three tails, the well-marked *Myrina* and *Horaga* groups. These are connected by a few genera with single tails of extraordinary length, accompanied by a distinct lobe (*Loxura* group), with the *Deudorix* group distinguished by their elongate hindwings produced anally into a long deep and distinct lobe, and furnished with one tail. Here and there stand peculiar genera which diverge from the more distinct types and seem to mar the exact order based on the selected classificatory characters, but which appear to have natural affinities with the groups in or near which they are located in the Key.

Admitting that a "natural system" must take cognizance of all or nearly all the different structural features, &c., of the several forms, it is manifest that it is in the egg stage that the number of these characters is at a minimum; and it is therefore probable that the egg may more readily furnish a few marked distinctive features whereon to found main groups. In this view Mr. Doherty's investigations should be of great value to Indian Lepidopterists. He recognizes (*vide supra*, p. 6) six subdivisions of Indian *Lycænidæ*, founded on the form of the egg; and these happen to accord well with the groups herein adopted and founded on various characters in the perfect insect. His *Gerydinæ* accord with the *Gerydus* group of this work: his *Lycæninæ* with our *Lycæna* and *Polyommatus* groups; his *Poritinæ* with our *Poritia* group; his *Theclinæ* embrace the *Thecla* and *Myrina* groups; and his *Deudorigina* and *Amblypodinæ* agree generally with the groups of the same name in the following Key.

Key to the Indian Genera of LYCÆNIDÆ.

Gerydus group

A. Forewing with less than four subcostal nervules[*], forewing less than three inches in expanse.

- *a*. Legs abnormal, deformed in either the tibia or the tarsus. Both sexes, forewing with three subcostal nervules.
  - a^1. Legs very long; tarsi abnormal.
    - a^2. First joint of tarsi elongated, widened and compressed; forewing with upper discoidal nervure originating from subcostal nervure beyond end of cell.
      XCV.—GERYDUS.
    - b^2. First joint of tarsi elongated, but neither widened nor compressed.
      - a^3. Forewing with upper discoidal nervule originating from subcostal nervure beyond end of cell, third subcostal nervule short.
        XCVI.—PARAGERYDUS.
      - b^3. Forewing with upper discoidal nervule originating from subcostal nervure at end of cell; third subcostal nervule long.
        XCVII.—ALLOTINUS.
  - b^1. Legs short, also abnormal, apices of tibiæ globosely incrassated; forewing with upper discoidal nervule originating from subcostal nervure beyond end of cell.
    XCVIII.—LOGANIA.
- *b*. Legs normal, as described typically for the family *Lycænidæ*.

Poritia group

  - a^1. Forewing, first subcostal nervule anastamosed completely with costal nervure, except a very short free basal portion.
    - a^2. Both sexes, forewing with four subcostal nervules; male with no secondary sexual characters.
      XCIX.—ZARONA.
    - b^2. Both sexes, forewing with three subcostal nervules.
      - a^3. Male with secondary sexual characters, hindwing, upperside with a tuft of hair in discoidal cell, and another on abdominal margin.
        C.—PORITIA.
        CI.—PSEUDODIPSAS.

Lycæna group.

      - b^3. Male with no secondary sexual characters.
        CII.—PITHECOPS.
  - b^1. Forewing, first subcostal nervule with its apical portion free from costal nervure as well as its basal portion, often entirely free.
    - a^2. Hindwing not provided with tails[†] or lobes, not prolonged or produced posteriorly; outer margin rounded and entire, not dentate.
      - a^3. Both sexes, upperside, both wings of some shade of fuscous or brown, never blue or purple; forewing, first subcostal nervule entirely free from costal nervure.
        - a^4. Both sexes, forewing with three subcostal nervules.
          - a^5. Both sexes, forewing, costa and outer margin strongly convex.
            CIII.—NEOPITHECOPS.

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[*] Except the genera *Amblypodia*, *Iraota* and *Zetius*, which have four subcostal nervules in the forewing in the male, and three in the female, and *Zarona* and *Dacalana*, which have four subcostal nervules in both sexes.

[†] Except the genus *Megisba*, which is abnormal in some species, or forms, or individuals, having a single delicate short filamentous tail.

Male, forewing triangular, costa and outer margin nearly straight.

a^6. Antennæ incrassate, without well-formed club, less than half the length of costa of forewing.

a^7. Underside, both wings marked with numerous fine zigzag dark brown lines.

CIV.—SPALGIS.

b^7. Underside, both wings marked with numerous prominent and rounded large black spots.

CV.—TARAKA.

b^6. Antennæ with well-formed club, half or more than half the length of costa of forewing; sometimes not tailed, sometimes with a very delicate tail to hindwing.

CVI.—MEGISBA.†

b^5. Both sexes, forewing with two subcostal nervules.

CVII.—NEOLYCÆNA.

Male, upperside, both wings more or less of some shade of blue or purple. Both sexes, forewing with three subcostal nervules.

a^4. First subcostal nervule very near to or touching costal nervure, but not anastomosed with it.

Hindwing with second median nervule given off before lower end of cell.

a^6. Third subcostal nervule arising from costal nervure nearer to base of upper discoidal than to apex of wing.

CVIII.—LYCÆNA.

CIX.—CHILADES.

Third subcostal nervule arising from costal nervure nearer to apex of wing than to base of upper discoidal.

CX.—CYANIRIS.

b^5 Hindwing with second median nervule given off at lower end of cell

CXI.—*ZIZERA*.

First subcostal nervule anastomosed with costal nervure, except a short length at base and terminal portion which runs free to costa

a^4 Costa of hindwing convex, apex of wing rounded.

CXII.—AZANUS.

b^4. Costa of hindwing slightly concave, apex of wing acute.

CXIII.—ORTHOMIELLA.

b^3. Hindwing with three ciliated very short and fine tails, no lobe, not prolonged or produced posteriorly; outer margin rounded and entire, not dentate. Both sexes, forewing with three subcostal nervules.

CXIV.—LYCÆNESTHES.

c^3. Hindwing not provided with tails or a lobe, outer margin entire, not dentate, anal angle of male acute. Both sexes, forewing with three subcostal nervules.

CXV.—NIPHANDA.

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† Except the genus *Megisba*, which is abnormal in some species, or forms, or individuals, having a single delicate short filamentous tail.

Polyommatus group.

d^2. Hindwing short, with a short delicate filamentous tail at end of first median nervule;* no lobe; not prolonged or produced posteriorly; outer margin rounded and entire, not dentate. Both sexes, forewing with three subcostal nervules.

- a^3. Forewing, first subcostal nervule anastomosed with costal nervure soon after its origin, but again becoming free and running free to costa.
  - a^4. Hindwing, underside, base bearing black spots
    - a^5. Both sexes, both wings, upperside black, anal half of hindwing orange.
      CXVI.—Talicada.
    - b^5. Male, both wings, upperside blue; both sexes, hindwing, anal half concolorous with rest of wing.
      CXVII.—Everes.
  - b^4. Hindwing, underside, base not bearing black spots, but both wings having catenulated white bands.
    CXVIII.—Nacaduba.†
- b^3. Forewing, first subcostal nervule connected with costal nervure by a short spur, otherwise free.
  - a^4. Male, forewing, upperside, basal two-thirds shining metallic steel-blue or purple, exterior one-third black.
    CXIX.—Jamides.
  - b^4. Male, both wings, upperside, pale azure-blue or bluish milky-white, with narrow exterior black border, one Malayan species green.
    CXX.—Lampides.
- c^3. Forewing, first subcostal nervule impinging on or almost touching costal nervure
  - a^4. Underside, both wings brown or drab, with whitish-bordered catenulated markings.
    CXXI.—Catochrysops.
  - b^4. Underside, both wings, whitish or greyish, with black, brown, or rusty dashes and spots
    CXXII.—Tarucus.
  - c^4. Underside, both wings with blackish oblique basal fasciæ, blotches and spots
    CXXIII.—Castalius.
- d^3. Forewing, first subcostal nervule free from costal nervure.
  CXXIV.—Polyommatus.

Amblypodia group.

Hindwing elongated and produced at anal angle, which is rather broadly lobate and tailed at end of submedian nervure. Male, forewing with four subcostal nervules, female with three

- a^3. Both sexes, hindwing with one tail; forewing, costal nervure ending on outer margin below apex of wing
  CXXV.—Amblypodia.*
- b^3. Male, hindwing with one tail, female with two, male, forewing, costal nervure ending on outer margin below apex of wing, female ending at apex, both sexes, forewing, discoidal nervules with a common origin, middle disco-cellular nervule wanting. Male with small tuft of hairs on inner margin of forewing.
  CXXVI.—Iraota.*

Hindwing produced but truncated posteriorly, anal angle strongly lobate; male with one tail from third median nervule, female with additional tail from second median nervule. Both sexes, forewing with three subcostal nervules.
CXXVII.—Surendra.

Hindwing toothed at end of each vein in female, teeth hardly long enough to be called tails, no anal lobe, hindwing rounded. Both sexes, forewing with three subcostal nervules?
CXXVIII.—Apporasa.

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* Except the genera *Amblypodia*, *Iraota* and *Zeltus*, which have four subcostal nervules in the forewing in the male, and three in the female; and *Zarona* and *Dacalana*, which have four subcostal nervules in both sexes.

† Except in the genus *Nacaduba*, in which some species or climatic or seasonal forms, or individuals are found without these tails.

h^2. Hindwing with three short tails in female; a large anal lobe; hindwing elongated and somewhat produced posteriorly. Both sexes, forewing with three subcostal nervules?

CXXIX.—Thaduka.

i^2. Hindwing tailless, or with one tail from first median nervule, which is either filamentous, or short and stout, or spatulate. Hindwing not so short or evenly rounded as in the *Polyommatus* group. Both sexes, forewing with three subcostal nervules.

- a^3. Hindwing apex rounded, or but slightly produced; tail short and conical, or filamentous, or entirely absent.

CXXX.—Arhopala.

CXXXI.—Acesina.

- b^3. Hindwing, apex strongly produced and hooked; tail spatulate.

CXXXII.—Mahathala.

j^2. Hindwing sometimes angulate, sometimes rounded and entire; no tail; all species distinguished from all other genera (except *Drina*) by a shining silvery-white underside; also (except both sexes of *Amblypodia* and the males only of *Iraota* and *Zesius*) by having the costal nervure of forewing ending on outer margin below apex of wing. Both sexes, forewing with three subcostal nervules.

CXXXIII.—Curetis.

Thecla group.

k^2. Hindwing somewhat elongated, outer margin often somewhat dentate, usually furnished with a short filamentous tail from apex of first median nervule.

- a^3. Male with elongated glandular patch of scales at upper end of discoidal cell. Both sexes, forewing with two subcostal nervules; middle disco cellular in male arising far beyond, in female at base of, upper discoidal nervule.

CXXXIV.—*Thecla.*

- b^3. Males with no secondary sexual characters. Both sexes, forewing with three subcostal nervules.
  - a^4. Forewing, upper discoidal nervule given off from subcostal nervure long after apex of discoidal cell.
    - a^5 Hindwing, second median nervule given off before apex of discoidal cell.

CXXXV.—Zephyrus.

    - b^5. Hindwing, second median nervule given off at apex of discoidal cell.

CXXXVI.—Euaspa.

  - b^4. Forewing, upper discoidal nervule given off from subcostal nervure before or at apex of discoidal cell.
    - a^5. Female furnished with a tuft of closely-set hairs at the end of the abdomen.

CXXXVII.—Chætoprocta.

    - b^5. Female not furnished with a tuft of closely-set hairs at the end of the abdomen.
      - a^6. Forewing, underside, basal half with numerous black spots; hindwing with a filamentous tail at end of first median nervule, tail sometimes reduced to a tooth.

CXXXVIII.—Chrysophanus.

      - b^6. Forewing, underside, basal half unmarked; hindwing sometimes with an elongated tail, sometimes with only a tooth at end of first median nervule.

CXXXIX.—Ilerda.

l^2. Hindwing in male with two short filamentous tails under half an inch in length.

- a^3. Female with three tails. Male, forewing with four subcostal nervules, female with three.

CXL.—Zesius.*

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* Except the genera *Amblypodia*, *Iraota* and *Zesius*, which have four subcostal nervules in the forewing in the male, and three in the female; and *Camena* and *Dacalana*, which have four subcostal nervules in both sexes.

- b^3. Females with two tails.
  - a^4. Male, forewing with four subcostal nervules; secondary sexual characters as in the following genus (*Arrhenothrix*).

    CXLI.—DACALANA.*
  - b^4. Male, forewing with three subcostal nervules.
    - a^5. Male, hindwing with glandular patch of scales near costal base.
      - a^6. Male, forewing, upperside with tuft of hairs on middle of submedian interspace, also with tuft of hairs turned under and upwards on inner margin towards base.

        CXLII.—ARRHENOTHRIX.
      - b^6. Male, forewing, upperside with no tuft of hairs on middle of submedian interspace.
        - a^7. Male, forewing with tuft of hairs turned under and upwards on inner margin towards base.

          CXLIII.—CAMENA.
        - b^7. *Male, forewing with no tuft of hairs* turned under and upwards on inner margin towards base

          CXLIV.—MANECA.
    - b^6 Male, both wings without secondary sexual characters.
      - a^6. Tails at apices of first and second median nervules.

        CXLV.—MOTA.
      - b^6 Tails at apices of submedian nervure and first median nervule.
        - a^7. Forewing, middle disco cellular nervule arising at base of upper discoidal; disco-cellular nervules of equal length.

          CXLVI.—APHNÆUS.
        - b^7. Forewing, middle disco-cellular nervule arising from upper discoidal some little distance beyond its base; middle disco-cellular nervule much shorter than lower disco cellular.
          - a^8. Third subcostal nervule long, tails of equal length.

            CXLVII.—TAJURIA.
          - b^8. Third subcostal nervule very short; inner tail much longer than outer tail

            CXLVIII.—SUASA.
  - c^4. Male, forewing with two subcostal nervules
    - a^5 Forewing, first subcostal nervule and costal nervure well separated.
      - a^6. Female with outer tail ciliated, longer than inner tail; longer in the female than in the male.

        CXLIX.—THAMALA.
      - b^6 Both sexes with both tails filiform, of nearly equal length in both sexes.

        CL.—HYPOLYCÆNA.
    - b^5. Forewing, first subcostal nervule strongly bowed upwards towards costal nervure and nearly touching it.

      CLI.—CHLIARIA.

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* Except the genera *Amblypodia*, *Iraota*, and *Zesius*, which have four subcostal nervules in the forewing in the male, and three in the female; and *Zarona* and *Dacalana*, which have four subcostal nervules in both sexes.

Myrina group.

m^3. Hindwing, both sexes with two *tails*, one *tail over half an inch in* length.

  a^3. Inner tail from end of submedian nervure the longer; male with no secondary sexual characters.

    a^4. Both sexes, forewing with two subcostal nervules.

CLII. ZELTUS.

    b^4. Both sexes, forewing with three subcostal nervules.

CLIII.—CHARANA.

  b^3. Outer tail from end of first median nervule the longer. Both sexes, forewing with three subcostal nervules.

    a^4. Males with no secondary sexual characters.

      a^5. Forewing, apex truncated, outer margin concave from apex to termination of third median nervule.

CLIV.—CHERITRELLA.

      b^5. Forewing, apex acute, outer margin straight.

        a^6. Outer tail very broad at base, tapering to apex; forewing, middle disco cellular very short, one-third the length of lower disco-cellular nervule.

CLV.—NEOMYRINA

        b^6 Outer tail of equal breadth throughout, not very broad at base; forewing, middle disco-cellular almost as long as lower disco-cellular nervule.

CLVI.—TICHERRA.

    b^4 Male, hindwing with a small tuft of hairs at base of costal interspace.

CLVII.—CHERITRA.

Horaga group.

n^3. Hindwing, both sexes with three tails.

  a^4 Middle tail short, under quarter of an inch in length, all *tails* filiform, not ciliated Both sexes, forewing with two subcostal nervules.

    a^5. Forewing, costa *strongly* arched, costal *nervure* and subcostal nervules all well separated from each other.

CLVIII —RATHINDA.

    b^5 Forewing, costa nearly straight, costal nervure and subcostal nervules lying close together.

      a^6. Hindwing, lower disco-cellular nervule outwardly oblique, male, forewing, underside usually with glandular patch of scales on either side of submedian nervule near base of wing.

CLIX.—HORAGA.

      b^6. Hindwing, lower disco-cellular nervule upright; male with no secondary sexual characters.

CLX.—CATAPŒCILMA.

  b^4. Middle tail longer, over quarter of an inch in length, all tails strongly ciliated, male with secondary sexual characters.

    a^5. Male, hindwing with glandular patch of modified scales on either side of base of first subcostal nervule; both sexes, forewing with three subcostal nervules.

CLXI —BIDUANDA.

    b^5. Both sexes, *forewing with two* subcostal nervules.

      a^6. Male, forewing with glandular patch of scales on either side of submedian nervure near base of wing, below which inner margin of wing is outwardly bowed, no sexual patch on disc.

CLXII.—DRUPADIA.

      b^6 Male, forewing with glandular patch of scales on middle of disc, inner margin of wing straight; no patch on submedian nervure.

CLXIII.—EOOXYLIDES.

Loxura group.

o^3. Hindwing with one very long tail; hindwing greatly elongated *posteriorly* and lobate at anal angle, male with no "sex-mark" below costa of hindwing

a^{3}. Anal lobe blended with tail; male with no secondary sexual characters; both sexes, forewing with three subcostal nervules.

CLXIV.—LOXURA.

b^{3}. Anal lobe distinct from tail; male, hindwing with elongated glandular patch of scales on first median nervule; both sexes, forewing with two subcostal nervules.

CLXV.—YASODA.

Deudorix group.

Hindwing elongated and produced posteriorly, with a well-formed anal lobe (except in *Drina*), the single tail variable in length. Both sexes, forewing with three subcostal nervules.

a^{3}. Males with no secondary sexual characters.

a^{4}. Anal lobe small; tail in male not filamentous, rather broad, about a quarter of an inch in length, ground-colour of underside shining silvery-white as in *Curetis*.

CLXVI.—DRINA.

^{4}. Anal lobe large; tail in male filamentous, in female much longer and highly ciliated; female, upperside, both wings fuscous, hindwing with a large white patch towards anal angle.

a^{5}. Of large size; underside, ground-colour green or clear ochreous; forewing, first subcostal nervule free from costal nervure.

CLXVII.—LEHERA.

b^{5}. Of small size; underside, ground-colour ferruginous and white; forewing, first subcostal nervule touching costal nervure.

CLXVIII.—ARAOTES.

^{4}. Anal lobe large; tail in both sexes short and filamentous; female, upperside, hindwing with no large white patch towards anal angle.

a^{5}. Upperside, male red, female fuliginous.

CLXIX.—DEUDORIX.

b^{5}. Upperside, both sexes purple.

CLXX.—ZINASPA.

Males with secondary sexual characters. Hindwing with "sex-mark" below costa

a^{4} Male, forewing, no tuft of hairs on inner margin near base; hindwing, glandular "scale" patch terminating at base of first subcostal nervule; tail short and filamentous.

CLXXI.—HYSUDRA.

b^{4}. Male, forewing, tuft of hairs on inner margin near base, turned under and upwards.

a^{5}. Male, hindwing, glandular "scale" patch very variable in size, extending a short distance along basal portion of first subcostal nervule, but not reaching into interspace below; tail short and filamentous.

CLXXII.—RAPALA.

b^{5}. Male, hindwing, glandular "scale" patch extending across base of subcostal interspace, but not into discoidal cell; tail very long and highly ciliated.

CLXXIII.—BINDAHARA.

c^{5}. Male, hindwing, glandular "scale" patch extending slightly into discoidal cell, tail short and filamentous.

a^{6}. Of large size; forewing, middle disco-cellular nervule originating at base of upper discoidal.

CLXXIV.—VIRACHOLA.

b^{6}. Of small size; forewing, middle disco-cellular nervule originating a little beyond base of upper discoidal nervule.

CLXXV.—SINTHUSA.

Liphyra group.

B. Both sexes, forewing with four subcostal nervules; forewing more than three inches in expanse.

CLXXVI.—LIPHYRA.

The first division which I make in the Indian *Lycænidæ* I have called the *Gerydus* group, and is the same as Mr. Doherty's subfamily *Gerydinæ*, but with the addition of the genus *Logania*, Distant. Mr. Doherty states that the *Gerydinæ* are distinguished in all the species he has examined "by the extraordinarily flattened egg," which is "less than one-third as high as wide, delicately and sometimes obsolescently reticulate, sometimes carinate, flat above and below." The group is also distinguished "by the curious structure of the prehensores, the clasps [bifid uncus] being very long, broad, thin and plate-like, somewhat resembling the 'valves' of the *Papilionidæ*."* But the chief peculiarity of the group appears to me to be the very long legs, which in the first of these three genera Professor Westwood described as being "slender, scaly, compressed; the tarsi of all the feet with the basal joint remarkably elongated, widened, and quite compressed; the tarsus in the forelegs of the male being exarticulate, and as long as the femur and tibia united: second, third, and fourth joints in the four hindlegs very short, terminal joint small, subovate, notched at its obliquely truncated extremity, with extremely minute ungues."† In *Allotinus* and *Paragerydus* the legs are still very long, but the first joint of the tarsus instead of being flattened is rounded. The elongation of the tarsus necessarily renders the legs as a whole very long; they are indeed longer in *Gerydus*, *Allotinus* and *Paragerydus* than in any other group of the *Lycænidæ* known to me It is probable that this group includes the genus *Miletus* of Hubner, of which the *Papilio polycletus* of Linnæus from Amboina is the type. As I have not seen this species, I cannot say with certainty whether or not it is of this group; but Mr. Kirby in his "Synonymic Catalogue," p. 378, places it in the genus *Hypochrysops* of Felder, which includes very different insects, that are apparently more nearly allied to species of the genus *Poritia*, Moore, than to the butterflies of this group The male of *Miletus polycletus*, as figured by Cramer, is rich blue on the upperside, quite different from the dull brown and white butterflies included in the three following genera of this work These genera, which alone possess the greatly elongated legs, have their head-quarters probably in the true Malayan region, and may certainly be said to be confined to the Indo-Malayan region. In India they are found in the North-East Himalayas only, extending southwards into Burma. The males have no secondary sexual characters.

Genus 95.—GERYDUS, BOISDUVAL (PLATE XXVI).

Gerydus, Boisduval, Sp Gén., vol. i, pl. xxiii, fig. 2, *Gerydus symethus*, Cramer, *female imago*; 2a, *tarsus of foreleg of female*; 2b, *ditto of male* (1836), id., Distant, Rhop. Malay., p. 205, with woodcut of *posterior leg of Gerydus symethus* (1884), *Symetha*, Horsfield, Cat Lep. E I C, p. 59, pl. ii, fig. 2, *imago of Symetha pandu, male*; 2a, *female*; 2b–i, *structure of imago* (1828); *Miletus* Westwood (part, *nec* Hübner), Gen. Diurn. Lep., vol. ii, p. 502 (1852).

"FOREWING, elongate and ovate, *costal margin* arched and convex, *apex* subacute, *outer margin* obliquely convex, *inner* margin nearly straight, very slightly concave; *subcostal nervure* with four nervules, *first subcostal nervule* emitted about one-fourth before the end of the cell, *second* near the end of the cell, *third* a little beyond the cell, *fourth* minute, starting from the third a little before the apex. HINDWING, elongate and ovate, *costal margin* nearly straight, *posterior* margin convexly rounded, distinctly angulated in the female. *Eyes* naked; *palpi* very long, terminal joint long and slender; *legs* scaly and compressed, the first joint of the tarsi remarkably elongated, widened and compressed; *antennæ* slender, terminating in a slightly-formed club."

"This is a truly remarkable genus, the enlarged and widened basal joint of the tarsi being a phenomenal character in Rhopalocera. The focus of the distribution of *Gerydus* appears to be in the true Malayan region." (*Distant*, l. c.)

In the forewing the inner angle is sometimes much produced and hook-like, the costal nervure extends to a little beyond the end of the discoidal cell, the first subcostal nervule is given off from the costal nervure long before the end of the cell, the second just before its end, the third is given off rather nearer to the apex of the wing than of the cell, rather long; the costal nervure terminates at the apex of the wing; the upper discoidal nervule is given off from the subcostal nervure far beyond the apex of the cell, a feature which occurs in six other Indian genera only; the disco-cellular nervules are of about equal length and slightly concave; the second median nervule is given off from the median nervure some distance before the end of the cell. In the hindwing the disco-cellular nervules are of equal length, the upper is straight, the lower is slightly concave, the second median nervule given off just before the end of the cell.

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* Doherty, Journ A. S. B., vol. lv, pt. 2, pp 110, 132 (1886).

† Genus *Miletus*, Westwood, Gen. Diurn. Lep., vol. ii, p. 502 (1852).

This genus is certainly quite unique from the peculiar structure of the legs. The prehensores of the males are as curiously formed as are the tarsi of the legs: the claspers are very long, thin, and plate-like, somewhat similar to those organs in some of the *Pierinæ* and *Papilioninæ*, and with a tuft of hairs projecting from between them anteriorly below. Five species of *Gerydus* are found within Indian limits. The coloration of the upper side is black or dark brown, with a white or pale ochreous discal band, the underside with numerous chains of pale brown spots on an ochreous-brown ground. The males have no secondary sexual characters. I am unable to give the distribution of the genus exactly, but it is probably confined to the Oriental region; nor the number of species it contains, as some species which have their legs similar to those of *Allotinus* and *Paragerydus* have been hitherto placed in *Gerydus*. *G. melanion*, Felder, from the Philippines, of which I possess specimens sent me by Herr Georg Semper, is very near to, but distinct from, *G. boisduvali*, Moore. One species, *G. chinensis*, Felder, has been described from Hongkong, China.

Key to the Indian species of Gerydus.

A. Both sexes, upperside, forewing with a discal white band.
  a. Male, upperside with the base of the forewing bluish-grey, the discal white fascia broad, female with the white fascia occupying more than half the wing.
    617. G. SYMETHUS, Burma, Malacca, Nias Island, Sumatra, Java, Sumba, Sumbawa, Flores, Amboina, Papua.
  b. Male, upperside with the base of the forewing fuscous.
    a¹. Of large size, discal band of forewing strongly recurved to inner margin.
      618. G. ANCON, Burma.
    b¹. Of smaller size, discal band of forewing smaller, not reaching inner margin.
      619. G. BIGGSII, Burma, Malacca.
B. Both sexes, upperside, forewing with a pale ochreous streak beyond the end of the cell, with two similar spots below it, divided by the first median nervule.
  a. Both sexes, underside, markings pale brown.
    620. G. BOISDUVALI Sikkim, Chittagong Hill Tracts, Mergui, Tenasserim Valley, Java.
  b. Both sexes, underside, markings very dark umber brown.
    621. G. CROTON, Burma.

617. **Gerydus symethus**, Cramer.

Papilio symethus, Cramer, Pap. Ex., vol. ii, pl. cxlix, figs. B, C, *female* (1777); id., Stoll, Suppl. Cramer, pl. xxxvii, figs. 3, 3c, *female* (1790); id., Fabricius, Sp Ins., vol. ii, p. 119, n. 528 (1781), idem, id., Mant. Ins., vol. ii, p. 69, n. 656 (1787); *Hesperia symethus*, id., Ent. Syst., vol. iii, pt. i, p. 280, n. 76 (1793); *Polyommatus symethus*, Godart, Enc. Méth., vol. ix, p. 675, n. 180 (1823), *Gerydus symethus*, Boisduval, Sp. Gén., vol. i, pl. xxiii, fig. 2, *female; 2a, tarsus of foreleg of female; 2b, ditto of male* (1836), id., Butler, Cat. Fab. Lep. B. M., p. 160, n. 1 (1869); idem, id., Trans. Linn. Soc. Lond., Zoology, second series, vol. i., p. 546, n. 3 (1877); id., Distant, Rhop. Malay., p. 205, n. i, pl. xx, fig. 2, *male*; pl. xxii, fig. 14, *female* (1884); *Miletus symethus*, Snellen, Tijd. voor Ent., vol. xix, p. 152, n. 37 (1876); *Symetha pandu*, Horsfield, Cat. Lep. E. I. C., pl. ii, figs. 2, *male; 2a, female; 2b—i, structure* of *imago* (1828).

HABITAT: Moulmein, Penang (*Butler*); Sumba, Sumbawa, Flores (*Doherty*); Amboina, Papua (*Westwood*); Malacca; Nias Island; Sumatra; Java.

EXPANSE: ♂, ♀, 1·3 to 1·7 inches

DESCRIPTION: "Male. UPPERSIDE, *forewing* greyish-white, the base and basal half of the costal area bluish-grey; about the apical half of the wing black, with its inner margin oblique and profoundly sinuate, and the apical third of the inner margin of the same colour. *Hindwing* bluish-grey, the costal area blackish, a pale discal streak extending through and beyond the cell. *Cilia* pale greyish. UNDERSIDE, *both wings* pale brownish. *Forewing* with an oblique medial whitish fascia, before and beyond which the colour is dark bluish-grey, and with the following spots and fasciæ margined with grey:—two spots in the cell, a discocellular elongated spot at the apex of the cell, a spot between the first and second subcostal nervules, and another between the second and third, a waved fascia extending from the fourth subcostal nervule to about the third median nervule, and a submarginal row of small dark spots placed between the nervules. *Hindwing* with the following spots and fasciæ:—three beneath the costal nervure, three crossing the cell (the third at the apex), two beneath the cell (the second bifid), beyond these a waved transverse fascia crossing the wing, and a waved submarginal dark line. *Body* and *legs* more or less concolorous with the wings. FEMALE. Resembling the male, but with the hindwing more elongated and angulated. UPPERSIDE, *forewing* with the white area much larger. *Hindwing* with the white discal streak also larger and more distinct."

"Although the male specimens collected in Malacca show no variation, such uniformity in the species does not ensue when a larger series from the whole area of its distribution is examined. As I have noticed in the British Museum and other private collections, the variability is in the extent and distinctness of the white area to the forewing. It has been erroneously stated that this species inhabits ants' nests, but no real facts can be adduced in support of the assertion." (*Distant*, l. c.)

With reference to the last remark, it may be that ants carry the full-grown larvæ into their nests to perform their transformations as in the case of *Tarucus theophrastus*, Fabricius, and other species, but that the imagines inhabit the nests altogether, as has been stated, is almost certainly incorrect. I have only seen one female specimen of *G. symethus* kindly sent me by Mr W. Davison from Lancowie Island, eighty miles from Penang, where it was taken in March, and Moulmein is its only recorded Indian habitat.

618. **Gerydus ancon,** Doherty.

G. ancon, Doherty, Journ. A. S. B., vol. lviii, pt. 2, p. (1889).

HABITAT: Tenasserim valley, Tavoy district, Burma.

EXPANSE: ♂, 2·05; ♀, 1·85 inches.

DESCRIPTION: MALE. UPPERSIDE, *forewing* with the apex and outer margin black, the base dull fuscous, leaving about two-fifths of the area of the wing pure white; a white band extends obliquely from the costa one-fourth from the base, widening to the second median nervule two-thirds from the base, where it touches another white area extending from the second median nervule to the inner margin, of which it occupies the middle two-thirds, filling likewise nearly two-thirds of the interno-median interspace, and extending, except at its excised lower angle, within one-eighth of the outer margin, leaving the basal third of the interno-median interspace fuscous, and almost enclosing, with the upper band, an elongated black area occupying the basal part of the first median interspace, and united with the fuscous basal area. The third median nervule is swollen where it crosses the white band, from just beyond its origin one-fourth to its termination. *Hindwing* dull fuscous, unmarked. UNDERSIDE, *both wings* light rufous-brown, a series of obscure dark submarginal dots. *Forewing* with the white areas of the upperside reduced in size and set in a wide blackish area, a marginal dark line. *Hindwing* with obscure mottlings of slightly different shades of pale brown; three of these between the costal and subcostal nervures are bordered by transverse blackish lines, and an irregular blackish fascia extends obliquely across the disc from the submedian interspace to the discoidal nervule. FEMALE. UPPERSIDE, *forewing* lacks of course the swelling of the third median nervule; the lower white area much smaller than in the male, being narrow and oblique, occupying only one-third of the hind margin, bent inwardly above the submedian nervure, its terminal quadrate portion (between the second median nervule and the middle of the interno-median interspace) being dehiscent outwardly along the line of the first median nervule. *Hindwing* slightly angled in the middle. UNDERSIDE, *both wings* paler, less reddish and more variegated than in the male, and the markings very irregular.

Two males and a female from the Tenasserim valley, Tavoy district, were obtained by Mr. Doherty, the type pair of which I have examined. The species appears to be a very distinct one.

619 **Gerydus biggsii,** Distant.

G. biggsii, Distant, Rhop. Malay., p. 206, n. 2, pl. xxii, fig. 12, *female* (1884).

HABITAT: Burma, Malacca.

EXPANSE: ♀, 1·1 to 1·4 inches.

DESCRIPTION: "FEMALE. UPPERSIDE, *forewing* brown, about crossed near the middle by an oblique white fascia, beyond which the brown colour is much darker and almost black. *Hindwing* uniform brown, with the *cilia* paler. UNDERSIDE, *both wings* pale brownish, with spots and fasciæ margined with grey, arranged similarly to those of *G. symethus*, Cramer. *Forewing* with the white fascia as above. MALE, resembling the female. UPPERSIDE, *forewing* with the white fascia a little narrower. *Hindwing* more convex and less outwardly angulated." (*Distant*, l.c.)

I have received a single female of this species from Lieutenant E. Y. Watson, collected by him at Beeling, Upper Burma, in May. Mr. Doherty obtained it in the Tenasserim valley.

Another species, probably of this genus, has been described as below from Siam.[*]

620. **Gerydus boisduvali,** Moore. (PLATE XXVI, FIG 155 ♂).

Miletus boisduvali, Moore, Horsfield and Moore, Cat. Lep. Mus. E. I. C., p 19, n 2, pl. 1a, fig. 1, *female* (1857); id., Moore, Proc. Zool. Soc, Lond., 1865, p. 777; *Miletus boisduvalii*, Snellen, Tijd. voor Ent., vol. xix, p. 152, n. 38 (1876); id., Elwes, Trans. Ent. Soc. Lond., 1888, p. 374, n. 235.

HABITAT: Sikkim; Chittagong Hill Tracts; Mergui; Tenasserim Valley; Java.

EXPANSE: 1·33 to 1·60 inches.

DESCRIPTION: FEMALE. "UPPERSIDE, *both wings* brown. *Forewing* with a whitish fascia running from near the middle of the anterior margin to near the anal angle. *Hindwing* slightly angulated. UNDERSIDE, *both wings* pale brown. *Forewing* with the fascia as on the upperside intersected by the veins, and with three spots in the discoidal cell, one on each of the three anterior subcostal nervules; also an undulated spot near the anterior angle, and a small blackish dot between each nervule near the exterior margin. *Hindwing* also marked with undulated spots and stripes, and with a dot between each nervule. Form of wings as in *M.* [=*Gerydus*] *symethus*, Cramer, female." (*Moore*, l. c.) MALE. Differs from the female in having the pale markings of the UPPERSIDE of the *forewing* smaller, though these are very variable, being sometimes almost as large as in the female, at others almost obsolete; the wing is also longer, the apex acuminate, and the outer margin less convex; the hindwing rounded, not angulated, at the terminiation of the third median nervule. In addition to the markings described by Mr. Moore, there is a submarginal catenulated band on the underside of the forewing, and an oblique blackish straight macular band from the middle of the abdominal margin of the hindwing to the middle of the disc in some specimens of both sexes. It occurs rather commonly in Sikkim at low elevations in March, April, May, July, August, and October. Dr. Anderson took it in Mergui in March.

The figure shows both sides of a male specimen from Sikkim in my collection.

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[*] *Gerydus (Miletus) irroratus*, Druce, Proc. Zool. Soc Lond., 1874, p. 106. HABITAT: Nahconchaisee, Siam. EXPANSE: Not given. DESCRIPTION: "UPPERSIDE, *both wings* dark glossy brown, with a whitish spot at the end of the cell of *forewing*. UNDERSIDE, *both wings* very like *M. melanion*, Felder [from Luzon, one of the Phillippine Isles], but differs from it in having the light markings less clearly defined, and the white lines more indistinct." (*Druce*, l c.)

G. melanion has two spots on the upperside of the forewing in the male, one covering the base of the third median nervule, the other in the submedian interspace towards the anal angle. As *G. irroratus* is said to have only one spot, it may perhaps be recognised, but the description of it is most inadequate.

621. **Gerydus croton,** Doherty.

G. croton, Doherty, Journ. A. S. B., vol. lviii, pt. 2, p.   (1889).

HABITAT: Tenasserim Valley, Tavoy District, Burma.

EXPANSE: ♂, 1·80; ♀, 1·75 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* dark brown. *Forewing* with the apical part black, an obscure fuliginous-whitish [pale ochreous] band extending obliquely from beyond the end of the cell to the second median nervule two-thirds from its origin, two obscure whitish spots beyond and below it, one on each side of the first median nervule, the lower spot sometimes obsolete. UNDERSIDE, *both wings* very dark, variegated with many shades of brown. *Forewing* with the band of the upperside dull ochreous, broad and well-marked, the upper of the two spots large and but slightly separated from the band, and the lower one very small, oblique and distinct; there are some costal markings, a subapical cordate spot, and three submarginal blackish dots. *Hindwing* has the basal half very dark, with some paler brown tranverse markings edged with dark, a blackish semi-circular band, with a slight bluish gloss, extending across the wing beyond the cell, after which comes a semi-circle of joined cordate reddish-brown maculæ, beyond which the ground is again dark, with a light brown marginal band near the apex. FEMALE. UPPERSIDE, *forewing* with the band more distinct and nearly white, extending obliquely almost to the costa and to the second median nervule two-thirds from its origin, the upper of the two spots separated from it only by the vein, the lower spot smaller and more isolated. UNDERSIDE, *both wings* much lighter and more variegated than in the male. *Forewing* with the dark submarginal dots forming a complete series. *Hindwing* with the outer part pale brown, except a large sordid area developed round the third median nervule as centre."

"The inner angle of the forewing is in this species somewhat less produced inferiorly than in *G. ancon,* Doherty. The hindwing of the female is somewhat more angled in the middle. In the male the third median nervule of the forewing is not swollen. The prehensores differ but slightly in the two species." (*Doherty,* l. c.)

Mr. Doherty obtained two males and a female of this species in the Tenasserim Valley. He notes that, like *G. ancon,* it "has a strong irregular flight (quite different from the feeble, uncertain motions of the *Paragerydi* and *Loganias*), wheeling many times round the same circle or up and down a certain length of the path, and would be difficult to catch but for its habit of returning again and again to the same leaf."

Another very distinct species of this genus occurs in the Malay Peninsula, and is described below.* The male has a broad pure white discal band on the upperside of the forewing, all the markings of the underside very clearly defined. The female is unknown.

Genus 96.—Paragerydus, Distant. (PLATE XXVI.)

Paragerydus, Distant, Rhop. Malay., p. 207, woodcut n. 60, posterior leg of *Paragerydus horsfieldi,* (1884); p. 451 (1886).

"Closely allied to *Gerydus,* Boisduval, but differing by having the first joint of the tarsi greatly elongated, but not widened and compressed as in *Gerydus;* the female also differs from the male in having the outer margin of the hindwing dentately sinuate." *Eyes* naked.

"The position of *Paragerydus* is readily defined as allied to *Gerydus* and *Logania,* Distant, by having the third subcostal nervule of the forewing emitted beyond the end of the cell, and it differs from the first by the non-compressed and non-dilated tarsi, and from the second by the non-globosely incrassated tibial apices." (*Distant*, l. c., p. 207.)

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* *Gerydus gopara,* n. sp. HABITAT: Perak, Malay Peninsula. EXPANSE: *Male,* 1·55 inches. DESCRIPTION: MALE. UPPERSIDE, *both wings* dark brown. *Forewing* with the apical half still darker brown; the disc crossed by a very regular broad pure white band, commencing at the subcostal nervure, ending in the middle of the submedian interspace, its inner edge short and straight, its outer edge about twice as long and convex. *Hindwing* unmarked. UNDERSIDE, *both wings* pale purplish-brown. *Forewing* with the discal band as above, but much less prominent, its edges irregular, marked with a prominent spot at its lower outer angle; two spots across the middle of the cell, the outer the larger, another closing the cell, three spots on the costa, a subapical catenulated band of five spots—all these spots a little darker than the ground-colour, outwardly defined by a very fine grey line; a regular marginal series of short blackish lines between the veins. *Hindwing* crossed by several catenulated bands, and the marginal linear spots as in the forewing.

This species appears to be very distinct, and has no very near ally. It differs from *G. symethus,* Cramer, and *G. biggsii,* Distant, in having all the markings clear and well-defined on the underside even more distinct than in *G. boisduvali,* Moore, instead of much blurred and indistinct as in the two former species. In the well-defined regular pure white band of the forewing on the upperside it differs from all.

In the forewing of the type species the first subcostal nervule is given off much in the same position as in *Gerydus;* the second subcostal in the male is given off at, instead of a little before, the end of the cell, in the female it is given off some little distance before the end, and the third subcostal is much shorter, and originates much nearer to the apex of the wing than it does in *Gerydus;* the upper discoidal nervule originates from the subcostal nervure after the apex of the cell in the same extraordinary way as it does in *Gerydus,* but its origin is a little nearer to the cell. Other characters of neuration much as in *Gerydus.* The prehensores of the male are formed as in *Gerydus,* and that sex has no secondary sexual characters.

The genus contains but three known species at present, which occur in Burma, the Malay Peninsula, Sumatra, Java, and Borneo. They are plain brown insects above, paler in the middle of the forewing in one species; underside white or greyish, thickly sprinkled with minute and larger-sized brown or ochreous dots and spots. *P. fabius,* Distant, from Northern Borneo differs from the other known species in having the upperside of the hindwing in the female "with the posterior margin from anal angle to near lower subcostal nervule broadly greyish-white." *

Key to the Indian species of Paragerydus.

A Male, upperside, forewing with a prominent pale oval patch on middle of disc; underside, forewing with apex concolorous with rest of wing.

622. P. HORSFIELDI, Arakan, Chittagong Hill Tracts, Burma, Malay Peninsula, Nias Island, Sumatra, Java, Borneo.

B Male, upperside, forewing with no prominent pale oval patch on middle of disc; underside, forewing with apex tinged with rufous-brown.

623. P. TARAS, Chittagong Hill Tracts, Tenasserim Valley.

622. **Paragerydus horsfieldi,** Moore. (PLATE XXVI, FIG. 156 ♂).

Miletus horsfieldi, Moore, Horsfield and Moore, Cat. Lep Mus. E. I. C., vol. i, p. 19, n. 3, pl. 1a, fig. 2, *male* (1857); id., Druce, Proc. Zool. Soc. Lond., 1873, p. 347, n. 1; id., Staudinger, Ex Schmett., p. 269, pl. xciv, *male* (1888); *Gerydus horsfieldi,* Butler, Trans Linn. Soc., Zoology, second series, vol. 1, p. 546, n. 1 (1877); *Paragerydus horsfieldi,* Distant, Rhop Malay., p. 207, n. 1, pl. xx, fig. 7, *female* (1884); id, Doherty, Journ. A. S. B., vol. lv, pt. 2, p. 131 (1886); *Allotinus aphocha,* Kheil, Khop. Ins. Nias, p. 28, n. 79, pl. v, fig. 30, *female* (1884).

HABITAT: Arakan; Chittagong Hill Tracts; Burma; Malay Peninsula; Nias Island; Sumatra; Java; Borneo.

EXPANSE: ♂, 1·20 to 1·80; ♀, 1·10 to 1·60 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* brown. *Forewing* with an oval longitudinal whitish spot in the middle. *Hindwing* rounded and slightly angulated. UNDERSIDE, *both wings* creamy-white, densely covered with undulating brown strigæ, with a darker brown dot between each vein near the exterior margin. FEMALE. UPPERSIDE, *both wings* brown. *Forewing* with but a faint indication of lighter colour in the middle. *Hindwing* acute. UNDERSIDE, *both wings* as in the male." (*Moore,* l. c.)

"*Paragerydus horsfieldi,* and another allied species [*P. taras,* Doherty] entirely black above, occur abundantly in Arakan and the Chittagong Hill Tracts, north of which they have not yet been observed. The egg is not quite so flat as in *Allotinus multistrigatus,* de Nicéville, and there is no trace of carination: it is beautifully reticulate above." (*Doherty,* l. c.)

I possess numerous specimens taken in Rangoon from May to August and again in December, one pair taken at Bhamo in Upper Burma in August; there are two females from the Chittagong Hill Tracts taken by the late Mr. H. M. Parish in November, also one from Perak, in the Indian Museum, Calcutta; and Mr. Distant records it from Penang, Sunjei Ujong, Malacca, and Singapore. It is evident from the dimensions given above that this species varies much in size. I append Mr. Distant's description of it.* Mr. Elwes (Trans. Ent. Soc. Lond., 1888, p. 374, n. 236) records this species from Sikkim with doubt. I do not think it occurs north of Chittagong. Mr. Doherty writes: "This species is the commonest of the *Gerydinæ* from the Chittagong Hill Tracts to South-Eastern Borneo, found in great numbers wherever there is deep shade. I am inclined to think that this species (and not *F. taras*, mihi, with its conspicuous reddish apex and margin) is the *Allotinus unicolor* of Felder, but without examining the types of that species it is imposible to decide."

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* Ann. and Mag. of Nat. Hist., fifth series, vol. xix, p. 266, n. 104 (1887).

"The cell in this species ends half-way between the bases of the second and third subcostal nervules. On this character the genus *Paragerydus* has been formed, but it is improbable that it can be retained distinct from *Allotinus*. *P. taras* seems to be structurally half-way between the two."

The figure shows both sides of a male example from Bhamo, Upper Burma, in my collection.

623. **Paragerydus taras**, Doherty.

P. taras, Doherty, Journ. A. S. B., vol. lviii, pt. 2, p. (1889).

HABITAT: Tenasserim Valley, Burma; Chittagong Hill Tracts.

EXPANSE: ♂ ♀, 1·5 to 1·6 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* dark brown. *Forewing* dark brown, deepest apically, lacking the elongate discal brand of *P. horsfieldi*, Moore. UNDERSIDE, *both wings* creamy-white (dull bluish-grey in *P. horsfieldi*), the striæ less numerous, especially discally and basally, and less evenly distributed; the transverse macular discal band is nearly as obvious as in *P. horsfieldi*, but is composed of slender, crescent-shaped markings, beyond which is a submarginal line of blackish dots. *Cilia* rather long, rufous-brown. *Forewing* with the apex widely tinged with rufous-brown, the subapical blackish dots situated in the brown area touched outwardly with white. *Hindwing* with a rufous-brown marginal line. FEMALE. UPPERSIDE, *forewing* lacking the pale discal area of the female of *P. horsfieldi*; otherwise marked as in the male."

"In the male the forewing is longer and more acute than in *P. horsfieldi*, its outer margin but little curved, while in the female its upper portion is strongly convex. In the hindwing the degree of marginal undulation varies greatly, as is also the case with *P. horsfieldi*. The female is paler than the male. and while flying has almost the air of a white butterfly."

"The prehensores obviously differ from those of *P. horsfieldi*, the tip of the unci (*tegumina*) being rounded and obliquely truncate, while in *P. horsfieldi* they are very oblique and regularly tapering. As seen from the side, the clasps (*harpagones*) end in two processes separated by the deep sinus, the upper longest, and ending in a strong hook directed upwards. In *P. horsfieldi* the upper process is obsolescent, represented only by an angle in the upper contour of the other." (*Doherty*, l. c.)

The types are from the Tenasserim Valley, east of Tavoy, Burma, it occurs also in the Chittagong Hill Tracts. Mr. Doherty notes that "an apparently identical form occurs in the Malay Peninsula and South-Eastern Borneo, but I have no specimens now available for comparison."

Genus 97.—ALLOTINUS, Felder. (PLATE XXVI).

Allotinus, Felder, Reise Novara, Lep., vol. ii, p. 285 (1865); id., Distant, Rhop. Malay., p. 208 (1884); p. 451 (1886); id., Butler, Ent. Month. Mag., vol. xxii, p. 59 (1885).

"***Antennæ*** gradually thickened, a little longer than in ***Miletus***. ***Palpi*** with the third joint acicular [needle-shaped], rather long, especially in the female. ***Forewing***, with the ***subcostal nervure*** three-branched [excluding terminal portion of subcostal nervure], the third branch rather long, emitted beyond the cell, the ***upper discoidal*** nervule starting from the inclosure [*clausu*] of the cell, the *upper disco-cellular* nervule distinct. *Legs* rather long, slender, acicular, the hinder tibiæ nearly equal to the femora." *Eyes* naked.

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* "MALE. UPPERSIDE, *both wings* dark brownish. *Forewing* with a pale ochraceous streak beyond the cell, extending along the third median nervule for about half its length. UNDERSIDE, *both wings* greyish, thickly mottled with irregularly-shaped and sized brown markings. *Cilia* pale brownish. *Body* and *legs* more or less concolorous with the wings. FEMALE. Resembling the male, but with the *forewing* proportionally shorter, and its outer margin convex. *Hindwing* with the outer margin dentately sinuate. UPPERSIDE, *forewing* with the pale streak [of the male] almost obsolete" (*Distant*, l. c.)

"Very distinct from *Miletus*, Westwood, on account of the structure of its tarsi." (*Felder*, l. c.)

In the forewing the costal nervure terminates about opposite to the apex of the discoidal cell; the first subcostal nervule is given off long before, the second a little before the apex of the cell, the third subcostal is long and is emitted about midway between the apex of the cell and of the wing; the upper discoidal nervule emitted exactly at the apex of the cell; the other neural characters much as in *Gerydus*, Boisduval, and the prehensores of the male similar: that sex also has no secondary sexual characters.

Allotinus differs from *Gerydus* in having the tarsi rounded, not widened and compressed, and in the position of the upper discoidal nervule of the forewing, in this latter character it differs also from *Paragerydus*. It differs from *Paragerydus* in having the third subcostal nervule of the forewing long, and emitted at one-half between the apex of the discoidal cell and the apex of the wing, while in *Paragerydus* it is short, and is emitted at one-third before the apex of the wing only. *Allotinus* agrees with *Paragerydus* in the structure of the legs.

Dr. Felder described five species in this genus, inhabiting Singapore, Java, Celebes, and Luzon. Of these Mr. Distant takes *subviolaceus* as the type, while Mr. Butler following Mr. Scudder takes *fallax*, which "emits the third and fourth subcostal branches from a long foot stalk beyond the cell" of the forewing, while *subviolaceus* has it "emitted at or near end of cell." Four species occur within strict Indian limits, and two of these are the largest of the group. The males of these two species above are dark brown, with a pale fascia on the forewing; the female of one species is white on the upperside, the apex, outer margin, posterior angle, and part of the inner margin of the forewing, with the costa of the hindwing black; the female of the other species is very like the male of the first, having a curved pale ochreous fascia on the upperside of the forewing on the disc. Both species in both sexes have an immense number of minute and larger-sized brown dots and spots sprinkled over the underside. *Allotinus alkamah*, Distant, is altogether different from *A. drumila*, Moore, and *A. multistrigatus*, mihi: it is only a little more than half the size, the upperside of both sexes has a large discal and basal patch of violaceous in both wings, and the markings of the underside are quite different in character, the ground-colour being profusely sprinkled with ochreous-brown spots very similar to those in *Paragerydus horsfieldi*, Moore. *Allotinus nivalis*, Druce, is again very distinct: both sexes are plain brown on the upperside without any markings whatever, the underside is white, spotted and mottled sparingly with brown, but in quite a different manner from *A. alkamah*. It is also smaller than that species. *A. multistrigatus*, *A. alkamah*, and *A. nivalis* in both sexes have the apex of the forewing simply acute, the outer margin entire (*A. nivalis* has it scalloped), the inner angle somewhat rounded. *A. drumila* has the apex highly acuminated, the outer margin scalloped, and the inner angle greatly produced. The genus is probably strictly confined to the Indo-Malayan region.

Key to the Indian species of Allotinus.

- A. Inner angle of forewing greatly produced.
    - 624. A. DRUMILA, Sikkim, Assam.
- B. Inner angle of forewing evenly rounded, not produced.
    - *a*. Of large size, with a pale curved discal fascia on the upperside of the forewing.
        - 625. A. MULTISTRIGATUS, Kumaon, Sikkim, Bhutan, Assam, Lushai country.
    - *b*. Of small size, both wings with disc and base above violaceous.
        - 626. A. ALKAMAH, Rangoon, Mergui, Malacca, Sumatra, Borneo.
    - *c*. Of still smaller size, both wings above entirely brown.
        - 627. A. NIVALIS, Burma, Malay Peninsula, Borneo.

624. **Allotinus drumila**, Moore.

Miletus drumila, Moore, Proc Zool. Soc. Lond., 1865, p. 777, pl. xli, fig. 12, *female*; *Gerydus drumila*, id., l. c, 1883, p. 521; *Miletus insignis*, Staudinger, Ex. Schmett., p. 269, pl. xciv, *female* (*nec male*) (1888).

HABITAT : Bengal, Darjiling, Khasias, Cachar, Lushai country.

EXPANSE : ♂ ♀, 1·75 to 2·2 inches.

DESCRIPTION : "MALE. UPPERSIDE, *both wings* dark umber-brown. *Forewing* with a pale medial longitudinal fascia curving from lower end of the cell across the disc. UNDERSIDE, *both wings* pale greyish-brown. *Forewing* with two pale-bordered transverse marks within the cell, one at its end, and another below the middle mark, a submarginal series of very irregular-shaped marks, and with several small pale-bordered irregular spots disposed about the discal area. *Hindwing* with three irregular-shaped pale-bordered cell-marks, four marks along anterior border, a discal confluent series ending at anal angle, two marks below the middle cell-mark, and three below the basal cell-mark, the middle one of the latter being black, small and round; interspersed between the marks are several pale-bordered irregular-shaped small spots." (*Moore*, l. c. in Proc. Zool. Soc. Lond., 1883.) [FE] " MALE. UPPERSIDE, *both wings* pall fuliginous-white, exterior margins scalloped. *Forewing* with the apex from the middle of the costa obliquely to below and near the middle of the exterior margin and thence retracing to posterior margin dark fuliginous-brown, with the tips of the veins on the costa brownish-white. *Hindwing* dark fuliginous-brown along anterior margin, with paler fuliginous marginal lunules. *Cilia* pale buff-coloured. *Antennæ* black. *Body* pale brown. UNDERSIDE, *both wings* very pale fuliginous-brown. *Forewing* with the disc broadly dull white, three short transverse brown bands within the cell, an irregularly-margined curved brown submarginal band, along the costa and exterior margin numerous small brown speckles. *Hindwing* with basal transverse pale-bordered marks, a short row of black-bordered dark brown pointed lunules proceeding from anal angle across the disc, with numerous brown speckles beneath it, and also on the anterior margin. *Palpi* and *body* beneath and *legs* pale brown." (*Moore*, l. c. in Proc. Zool. Soc. Lond., 1865.)

A rare species in Sikkim, Mr. Otto Moller possesses two males and three females, all taken in March and April. I also possess Sikkim specimens, and a male taken at Shillong in October. The Rev. Walter A. Hamilton possesses a female of this species taken in the Khasi Hills which has a broad black band extending down the abdominal margin of the hindwing on the upperside, but not quite reaching the extreme edge, no trace of which is found in the females from Sikkim that I have seen.

625. **Allotinus multistrigatus,** de N. (PLATE XXVI, FIGS. 157 ♂, 158 ♀).

A multistrigatus, de Nicéville, Journ A S B, vol lv, pt. 2, p 253, n 5, pl xi, fig. 11, *male; 2, female* (1886); id, Doherty, l c, p. 131, n. 156; id., Elwes, Trans Ent Soc. Lond, 1888, p 373, n. 234.

HABITAT : Askot, 5,000 feet, E. Kumaon; Sikkim; Bhutan; Shillong: Cherrapunji; Chittagong Hill Tracts; Sirtai Mountain, Lushai country.

EXPANSE : ♂, 2·1; ♀, 2·0 to 2·1 inches.

DESCRIPTION : "MALE. UPPERSIDE, *both wings* dark brown. *Forewing* with a pale brown elongated patch in the middle of the disc. *Hindwing* unmarked. UNDERSIDE, *both wings* pale ochreous-brown, covered (except the inner margin of the forewing) with hundreds of very minute spots, made up of a dark brown centre and fine outer pale line. *Forewing* with three similar but larger discoidal spots, and a fourth below the middle spot in the submedian interspace at the point where the first median nervule is given off; a similar submarginal series. *Hindwing* crossed by four almost equi-distant series of similar spots. *Cilia* pale brown throughout. FEMALE Differs in having the forewing more truncate and the hindwing more deeply scalloped than in the male. UPPERSIDE, *forewing* with the discal patch very prominent and pale ochreous, the basal half of the costal margin narrowly pale ochreous, with four short streaks beyond. *Cilia* pale ochreous. Otherwise as in the male."

"Quite different from any species known to me." (*de Nicéville*, l. c.)

"The tarsi of this species are cylindrical, the first joint nearly twice as long as all the others combined. The egg is extremely flat, strongly bicarinate at the side, more than three times as wide as high, with the sculpturing all but obliterated above. The third subcostal nervule is given off opposite the end of the cell, for which reason I put it in the genus *Allotinus*.

Of the Indian species [of this group], *A. drumila*, Moore, is very much like *A. multistrigatus*; it likewise has the legs cylindrical, but the third subcostal nervule is emitted a little beyond the end of the cell" (*Doherty*, l. c.)

"This species, though structurally different, according to Mr. Doherty, from the last [*A. drumila*], is very like it in general appearance, and I had some difficulty in knowing whether Moore's description of the male of *A. drumila* does not apply to *A. multistrigatus*. The position of the third subcostal nervule and the shape of the hind margin of the forewing distinguish them." (*Elwes*, l. c.)

With reference to Mr. Doherty's remark regarding the position of the third subcostal nervule in the forewing in this species, it is given off very far beyond, not at the apex of the discoidal cell; the upper discoidal nervule is given off at the apex of the cell. The neuration in *A. drumila* and *A. multistrigatus* is exactly the same.

Mr. Otto Moller possesses three males and one female, the latter taken in June, of this species from Sikkim. I have a female taken in Bhutan in August by Mr. A. V. Knyvett's native collectors, and another from Cherrapunji taken in September.

The figures of both sexes were taken from examples from Sikkim in Mr. Otto Moller's collection, and shew both sides.

Allotinus unicolor, Felder, has been described as below* from Singapore. It does not appear to have been found in the Malay Peninsula since it was first met with there by Mr. Wallace.

626. **Allotinus alkamah**, Distant.

A. alkamah, Distant, Rhop. Malay., p. 452, n. 8, pl. xliv, fig. 3 *male* (1886)

HABITAT: Rangoon, Mergui, Malacca, Sumatra, Borneo.

EXPANSE: ♂, 1·05; ♀, 1·4 inches.

DESCRIPTION: "MALE. Allied to *A. subviolaceus*, Felder [Reise Novara, Lep., vol. ii, p. 286, n. 368, pl. xxxv, figs. 27, 28, *male* (1865), from Java], from which it differs on the UPPERSIDE of the *forewing* by the much larger violaceous area, and consequent considerable diminution in the width of the blackish margin to the same. UNDERSIDE, *both wings* as in *A. subviolaceus* (judging from Felder's figure), but having some distinct short transverse darker strigæ. FEMALE. UPPERSIDE, *both wings* as in the male, but the *hindwing* paler and more violaceous. UNDERSIDE, *both wings* as in the male." (*Distant*, l. c.)

Of this species I have seen but a single female specimen taken by Lieut E. Y. Watson at Rangoon. It is the second smallest species of the genus occurring within strict Indian limits, and has the disc and base of both wings on the upperside in both sexes violaceous; the female has the hindwing suffused with whitish; both wings have a prominent linear black disco-cellular spot. The markings of the underside are nearer to those of *Paragerydus horsfieldi*, Moore, than to the other species of *Allotinus*, but they are more irregular in *A. alkamah*, and ochreous rather than brown.

627. **Allotinus nivalis**, Druce. (PLATE XXVI, FIG. 159 ♀).

Miletus nivalis, Druce, Proc. Zool. Soc. Lond., 1873, p. 348, n. 4; *Gerydus nivalis?* Butler, Trans. Linn. Soc. Lond., Zoology, second series, vol. i, p. 546, n. 2 (1877), *Paragerydus nivalis*, Distant, Rhop. Malay., p. 207, n. 2, pl. xxii, fig. 11, *female* (1884); *Logania substrigosa*, Moore, Journ. A. S. B., vol. liii, pt. 2, p. 22 (1884); idem, id., Journ. Linn. Soc. Lond., Zoology, vol. xxi, p. 39, pl. iii, fig. 8, *female* (1886).

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* *Allotinus unicolor*, Felder, Reise Novara, Lep., vol. ii, p. 286, n. 369 (1865); id., Distant Rhop. Malay., p. 207, n. 1 (1884); id., Distant and Pryer, Ann and Mag of Nat. Hist., fifth series, vol. xix, p. 266, n. 106 (1887). HABITAT: Singapore (*Felder*); Nias Island (*Kheil*); N. Borneo (*Distant*). EXPANSE: Not given. DESCRIPTION: "MALE. UPPERSIDE, rufescent-fuscous, darker towards the margin of the *forewing*. *Hindwing* with the *cilia* dull whitish, the margin before it darker. UNDERSIDE bluish-whitish, *cilia* swarthy-whitish, obsoletely at the end of the nervules spotted with blackish-fuscous; *both wings*, the internal margin of the forewing alone excepted, variegated finely with fuscescent, a submarginal series of small spots parallel with the margin fuscescent. *Forewing* with five irregular [*arrosis*] costal spots, a minute spot and a transverse litura in the cell, a disco-cellular fasciole, and an exterior fascia formed of six unequal spots. *Hindwing* with four minute basal spots, a pair of cellular spots, a disco-cellular irregular [*arrosa*] fasciole, two subcostal subbasal spots, two subcostal larger in the middle (the upper one more outwardly-placed), six others posterior in a series parallel with the margin (the two intermediate elongate, the rest equal, decreasing) and a seventh small internal hoary-brownish. *Abdomen* hoary-fuscous, whitish below."

"One specimen is the size of *A. fallax* [Felder, from Luzon], and with narrower wings than those of the female of *A. major* [Felder, from Celebes]; the hindwings also are more toothed than in the latter species." (*Felder*, l. c.) The expanse of *A. fallax* is about 1·3 inches.

HABITAT: Tenasserim Valley, Mergui, Malacca, Borneo.

EXPANSE: ·83 to 1·00 inch.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* dark brown. UNDERSIDE, *both wings* white, speckled with pale brown. *Forewing* with six black spots close to the outer margin. *Hindwing* with five." (*Druce*, l. c.) With reference to the last remark, Mr. Distant notes: "These spots would be more correctly described as marginal, and are scarcely reducible to the numbers given." FEMALE. "UPPERSIDE, *both wings* dark violet-brown. *Cilia* white between the veins. *Forewing* with a minute white dot at the end of the veins on the costa. UNDERSIDE, *both wings* purplish-white, crossed by a few ochreous brown short strigæ, and with a thicker streak across the middle and end of the cell, and in a zig-zag submarginal series; the outer marginal border ochreous-brown. *Forewing* with a marginal series of black spots. *Hindwing* with a lunular streak, and a black costal spot. *Body*, *antennæ*, and *legs* above brown; *palpi*, *legs*, and *abdomen* beneath white." (*Moore*, l. c.) MALE agrees with the female in markings, but has the *forewing* more elongated, the costa straighter, the apex more acute.

Mr. Druce's description of this species is quite inadequate, but as far as it goes it agrees with the species which Mr. Moore described as *Logania substrigosa*. The type of the latter is in the Indian Museum, Calcutta, and was taken by Dr. J. Anderson on Kisseraing Island in the Mergui Archipelago on 1st January, 1882. The figure is taken from this specimen, which is a female, and shows both sides. I should not have ventured to put *P. nivalis* and *L. substrigosa* together, had not Mr. Doherty assured me that they are one and the same species, he having taken it in large numbers both in S.-E Borneo and Burma, and at once recognised the identity of the specimens. He notes that it "obviously mimics *Neopithecops zalmora*, Butler, from which it is indistinguishable when flying"

In the next subgroup the legs are short. It contains the bulk of the Indian *Lycænidæ* in number both of genera and of species. This subgroup can be again divided by the structure of the legs, a single genus, *Logania*, Distant, which I place first, is unique in having the apex of the tibia of each leg swollen, while in every other genus of the family it is of uniform thickness throughout. It is very remarkable that it was only so lately as 1884 that the first species of the genus should have been described, as it is probable that this genus contains many species, which have a wide range in the Malay Peninsula and Archipelago. All the described species are small, and plainly coloured, they probably have a very weak flight, and escape the notice of the butterfly collector by their moth-like appearance. The males of *Logania* have no secondary sexual characters. The position of the genus is certainly very close to the three genera which precede it, as it has the same extraordinarily formed prehensores in the male, and a very similar egg, as Mr. Doherty informs me.

Genus 98.—LOGANIA, Distant. (FRONTISPIECE).

Logania, Distant, Rhop. Malay., p. 208, woodcut n. 61, posterior leg of *L. malayica*, Distant (1884).

"FOREWING, irregularly subtriangular, *costal margin* convex, the *apex* acutely produced, *outer margin* deeply and concavely sinuate, *inner* margin nearly straight; *costal nervure* extending to near the middle of the costal margin, *first subcostal nervule* emitted a little beyond the middle of the cell, second midway between the base of the first and the apex of the cell, *third* and *fourth* bifurcating at about two-thirds the distance from the end of the cell and the apex of the wing; bases of the third and second *median nervules* one-third nearer together than the bases of the second and first. HINDWING, elongate, the *costal margin* nearly straight, the *posterior* margin deeply sinuate, *first subcostal nervule* emitted a little before the end of the cell. *Palpi* very long, hirsute, the apical joint slender, but clothed with adpressed hairs. [*Antennæ* about half the length of the costa of the forewing, with a very slightly and gradually thickened club]. *Legs* with the apices of the tibiæ more or less globosely incrassated, the femora with a few slender spines."

"This pecular genus, which possesses superficially a Heterocerous appearance, is probably found throughout the Malay Peninsula." (*Distant*, l. c.)

In the forewing, the costa is regularly and evenly arched from the base to the apex, the apex is acuminate, the outer margin is scalloped but below the apex emarginated, then very convex to the inner angle, the inner margin is very slightly sinuous; the costal nervure hardly reaches opposite to the apex of the discoidal cell, well-separated from the first subcostal nervule, which latter is well-separated from the second subcostal, the base of the second subcostal is nearer to the base of the first than to the base of the upper discoidal, the third subcostal nervule is rather long, and is given off from the subcostal nervure rather nearer to the apex of the wing than of the cell; terminal portion of subcostal nervure reaching the costa almost at, or very shortly before, the apex of the wing; upper discoidal nervule given off from the subcostal nervure far beyond the apex of the cell; middle disco-cellular nervule straight, strongly inwardly oblique; lower disco-cellular longer, concave, upright; second median nervule given off rather close to the lower end of the cell; submedian nervure lying close to the inner margin, following its outline. Hindwing much elongated, costa very straight, apex and outer margin rounded, the latter posteriorly scalloped; costal nervure unusually straight, but little bowed at the base; first subcostal nervule given off very near to the apex of the cell; upper disco-cellular nervule short, slightly inwardly oblique, straight; lower disco-cellular longer than the upper, upright, very concave; second median nervule given off immediately before the lower end of the cell; submedian nervure straight; internal nervure extremely short, nearly straight. I am indebted to Mr. W. Doherty for a pair of the type species, *L. malayica*, Distant, from S.-E. Borneo. The wings of the male specimen I have bleached, and describe its neuration as above.

Six species are at present known, two occurring in Borneo, two in the Malay Peninsula, two in the Mergui Archipelago, and one from Nias Island They are all small butterflies, expanding about an inch, are dull-coloured or white on the upperside; four species have large patches of pale purple one on each wing, another species is white, with the outer margin of the forewing on the upperside broadly brown. They are all irregularly marbled and variegated on the underside.

Key to the Indian species of Logania.

A. Of large size, the pale violet-whitish patch of the forewing on the upperside anteriorly bounded by the median nervure; forewing with two subcostal nervules.
628. L. ANDERSONII, Mergui.

B. Of smaller size, the pale violet-whitish patch of the forewing on the upperside anteriorly extending beyond the median nervure; forewing with three subcostal nervules.
629. L. MARMORATA, Mergui.

628. Logania andersonii, Moore.

L. andersonii, Moore, Journ. A. S. B., vol. liii, pt. 2, p. 22 (1884); idem, id., Journ. Linn. Soc., Zoology, vol. xxi, p. 39, pl. iii, fig. 6, *female* (1886).

HABITAT: Mergui.

EXPANSE: ♀, 1·1 inch.

DESCRIPTION: "FEMALE. UPPERSIDE, *both wings* pale violet-brown. *Cilia* alternated with white. *Forewing* with a broad longitudinal medial lilacine-grey band of a somewhat triangular form, disposed below the cell, the exterior border of the band being scalloped. *Hindwing* with a narrow medial discal similar-coloured band. UNDERSIDE, *both wings* purplish lilacine-white, with a blackish zigzag cell-streak, a transverse discal zigzag duplex line, and two narrow similar submarginal lines, a slender marginal line, and a waved interciliary line." (*Moore*, l. c. in Journ. A. S. B.)

In describing this species, Mr. Moore does not refer to the *Hypolycæna libna* of Hewitson, described from Borneo,* to which it is obviously allied, if not indeed identical. *L. libna* is described as having a small pale blue spot near the costal margin of the forewing on the upperside, which appears also to be present in *L. andersonii*, though not mentioned by Mr. Moore, The only difference I can detect is that the pale blue band on the upperside of the hindwing, as figured in *L. libna*, is larger than in *L. andersonii*, but, Hewitson's type having been a mutilated specimen, this feature may have been incorrectly drawn. The type and only known specimen of *L. andersonii* is in the Calcutta Museum, and was taken by Dr. J. Anderson on Kisseraing Island, Mergui Archipelago, on 1st January, 1882. It is obviously not a *Logania*, as it has only two subcostal nervules to the forewing, as in *H. libna*, as pointed out by Hewitson in describing that species; neither is it a true *Hypolycæna*, as it has no tails to the hindwing, and the first subcostal nervule of the forewing just after its origin touches the costal nervure. As the type of *L. andersonii* is still unique, and I have not been able to procure a specimen for dissection and correct description of the neuration, I leave the species for the present in the genus *Logania* where Mr. Moore had placed it, proposing for it provisionally the new generic name *Cyaniriodes* in allusion to the character of the markings of the underside, which resemble those of *Cyaniris* in such a manner as to lead to the suspicion that it is a mimic of some species of that genus, but especially on account of the difference in neuration which has been detected by Mr. Doherty.

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* Ill. Diurn. Lep., Suppl., p. 15, n. 24, pl. v Suppl., figs., 39, 40, *female* (1869).

629. **Logania marmorata,** Moore. (FRONTISPIECE, FIG. 128).

L. marmorata, Moore, Journ. A. S. B., vol. liii, pt. 2, p. 22 (1884); idem, id., Journ Linn. Soc., Lond., Zoology, vol. xxi, p. 39, pl. iii, fig. 7 (1886).

HABITAT: Mergui.

EXPANSE: ·8 to 1·0 inch.

DESCRIPTION: "UPPERSIDE, *both wings* pale purplish violet-brown, the traversing veins being pale violet-brown. *Cilia* violet-brown. *Forewing* with the basal half, curving obliquely from the middle of the costa to the posterior margin near the angle, violaceous-white. *Hindwing* with the lower basal and discal areas also violaceous-white. UNDERSIDE, *both wings* densely mottled with purplish violet-brown and violet-white, interspersed with black speckles, which are most prominent in a lunular marginal fascia; a white spot at the end of the cells *Body, antennæ*, and *legs* violet-brown." (*Moore*, l. c)

There are two specimens of this species in the Indian Museum, Calcutta. taken by Dr. J Anderson. on Elphinstone Island, Mergui Archipelago, on 2nd and 9th March, 1882.

The figure shows both sides of the type specimen in the Indian Museum, Calcutta.

Logania malayica, Distant, and *L. sriwa*, Distant, have been described from the Malay Peninsula as below.*

In the next division, which I call the *Poritia* group, I have placed three genera. *Zarona*, mihi, and *Poritia*, Moore, have all of the first subcostal nervule of the forewing completely anastomosed with the costal nervure except a small portion of the base, which alone is free. I have seen no specimen of *Pseudodipsas*, Felder, and hence am unable to say whether or not it possesses this neural character, which is strictly confined to this group of Indian *Lycænidæ*, and to the genera

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* *Logania malayica*, Distant, Rhop. Malay., p. 208, n. 1, pl. xxii, fig. 21, *female* (1884) HABITAT: Sungei Ujong, Malay Peninsula; S.-E, Borneo. EXPANSE: *Male*, ·9; *Female*, ·9 to 1·2 inches. DESCRIPTION: "FEMALE UPPERSIDE, *both wings* white. *Forewing* with the costal margin narrowly fuscous, and the apical area narrowing to outer angle of the same colour. *Hindwing* with the outer margin very narrowly fuscous. UNDERSIDE, *both wings* white, thickly and irregularly mottled with brown. *Body* and *legs* brownish." (*Distant*, l. c.) Mr. W. Doherty has taken this species in S.-E. Borneo, and has given me a pair of specimens. The male does not differ from the female except in its smaller size.

Logania sriwa, Distant, Ann. and Mag. of Nat Hist., fifth series, vol. xvii, p. 531 (1886); idem, id., Rhop. Malay., p. 452, n. 2, pl. xliv, fig 16 (1886). HABITAT: Malacca. EXPANSE: ·98 inches DESCRIPTION: "UPPERSIDE, *both wings* violaceous-white. *Forewing* with the costal margin spotted with fuscous, and the apical area (not quite reaching to the outer angle) dark fuscous. *Cilia* of the hindwing spotted with fuscous. UNDERSIDE, *both wings* fuscous-brown with darker blotches, and irrorated and speckled with greyish-white; this whitish coloration is most prominent on the forewing at the apex and outer angles, and on the hindwing it appears as an irregular broad subcostal streak. *Hindwing* also more darkly marked than the forewing. *Body* above brownish, beneath greyish; *legs* very pale brownish with dark annulations.' (*Distant*, l. c.)

Mr. Doherty records this species (Journ. A. S. B., vol lviii, pt. 2, p. (1889) from Mergui, where the types of *L. marmorata*, Moore, were procured. I have seen the single female he obtained; it appears to differ from *L. marmorata* only by the greater prominence of all the markings of the underside. I am very much inclined to think that *L. sriwa* cannot stand as a species distinct from *L. marmorata*, and most likely the "*Miletus*" *lakonius* of Kheil (Rhop. Insel Nias, p. 27, n. 77, pl. v, figs. 28, 29 (1884), from the Island of Nias, will hereafter be proved to be another synonym of the same species. Mr. Doherty, speaking of this Mergui specimen of *L. sriwa*, says that: "It is very possibly distinct from *L. marmorata*, Moore, but the bad state of the types of that species makes it difficult to decide. On account of the short legs, I retain this species in *Logania*, though the tibiæ are but slightly thickened. Between this form and the true *Loganias*, with the 'apices of the tibiæ globosely incrassated,' I believe every gradation can be found Of the true *Loganias* a species (undescribed) occurs at Bassein, Burma; it is one of the smallest and obscurest of Indian butterflies. The type species, *L. malayica*, Distant, seems rare in the Malay Peninsula (where a number of other forms occur), but I found it rather common in south-eastern Borneo. The genus is also represented in Celebes."

Pithecops, Horsfield, and *Una*, mihi, as far as I am aware. The genus *Zarona* contains only two species known to me at present, and shares with the otherwise totally dissimilar genera *Dacalana*, Moore, and *Liphyra*, Westwood, the unusual feature of having four subcostal nervules (excluding the terminal portion of the subcostal nervure often called an additional subcostal branch) to the forewing in both sexes. Mr. Distant says that this character is found also in his genus *Deramas*, which I have not seen. The male of *Z. jasoda*, mihi, is very similar in general appearance to some species of the genus *Poritia*, the bright colouring of the upperside being blue in some lights, green in others. It has no secondary sexual characters. The genus *Poritia* contains some of the most beautiful species of the *Lycænidæ*, the males being as richly glossed on the upperside with blue in some lights, as they are with emerald green in others. When the species of this genus come to be carefully examined as to their structure, it will probably be found that many of them do not belong to *Poritia*, but have the neuration of one or other of the genera of the group. The males of *Poritia* have well-developed sexual tufts of hairs on the wings I am unaware if *Pseudodipsas* possesses similar characters. All the species of the group seem to be very rare

Genus 99.—ZARONA, nov. (FRONTISPIECE and PLATE XXV).

FOREWING, *costa* slightly and regularly arched, *apex* rather acute, *outer margin* nearly straight below the apex in the male, convex in the female, *inner* margin straight; *costal nervure* extending beyond the apex of the discoidal cell, *first subcostal nervule* given off from the subcostal nervure about two-thirds of the length of the cell from the base, completely anastomosed with the costal nervure, *second* subcostal with its base nearer to that of the first than to that of the upper discoidal; *third* subcostal with its origin about midway between the apex of the cell and of the wing; *fourth* subcostal given off midway between the base of the third and the apex of the wing, reaching to the apex of the wing; terminal portion of subcostal nervure extending to the outer margin below the apex of the wing, *middle disco cellular* nervule very short, with an apparently common origin with the upper discoidal; *lower* disco cellular about three times as long as the middle disco cellular, *second median* nervule emitted a little before the lower end of the cell. HINDWING, entire elongated in the male, the outer margin very straight in the male, giving the wing a truncated appearance, the wing broader in the female, the outer margin evenly rounded; *first subcostal nervule* given off rather near to the apex of the cell; *upper disco-cellular* nervule short, straight, outwardly oblique; *lower* disco-cellular longer than the upper, concave, slightly outwardly oblique; *second median* nervule given off immediately before the lower end of the cell BODY moderately robust, *abdomen* rather short; *antennæ* short, with a long, gradually formed club Male with no secondary sexual characters. Type, *Zarona jasoda*, mihi

There may be some slight inaccuracies in the diagnosis of this genus given above, as it has been drawn up from the two unique type specimens on which the genus is based, and which I have consequently only been able to examine by clarifying with benzine. The genus, though evidently closely allied to *Deramas*, Distant, may be known by the males possessing no tuft of long hairs in the discoidal cell of the hindwing on the upperside The shortness of the middle disco-cellular nervule of the forewing is unusual, but this may also be a feature of *Deramas*

Key to the species of Zarona.

A Male, underside, both wings with the ground colour deep glossy purplish brown, hindwing with discal band slightly outwardly marked with grey

630 Z JASODA, Burma.

B Female, underside, both wings with the ground colour dull reddish-purplish, hindwing with discal band not outwardly margined with grey

631 Z ZANELLA, Burma

630. **Zarona jasoda**, de N. (PLATE XXV, Fig 144 ♂).

Z jasoda, de Nicéville, Journ A S B, vol lvii, pt 2, p 280, n 9, pl xiv, fig 5, *male* (1888).

HABITAT. Pegu Hills, Burma

EXPANSE ♂, 1 4 inches.

DESCRIPTION· "MALE. UPPERSIDE, *both wings* black. *Forewing* with a streak on either side of the median nervure, a small patch filling the base of the second median and a larger one filling the base of first median interspace, a lengthened streak in the interno-median area, and placed outwardly obliquely above it is a large somewhat quadrate patch in the submedian interspace, all brilliant shining ultramarine blue inclining to brilliant emerald-green in some lights. *Hindwing* with the posterior two-thirds of the surface also blue crossed by the black veins, the outer margin narrowly black, and with somewhat diffused black spots placed upon and near the termination of the median nervules, two conjoined spots in continuation of these latter in the submedian interspace; costal and abdominal margins pale fuscous. UNDERSIDE, *both wings* deep glossy purplish-brown. *Forewing* with a discal macular irregular fascia, and with a double series of indistinct marginal lunules; inner margin pale. *Hindwing* with a very irregular discal macular fascia, outwardly slightly defined with whitish; marginal lunules much as in the forewing, some indistinct plumbeous irrorations towards the anal angle."

"Nearest to '*Poritia*' *pharyge*, Hewitson, from Perak and Borneo [described below*], from which it may at once be distinguished by the absence of the three subapical and six marginal blue spots, and by the presence of the broad streak in the interno-median area on the upperside of the forewing; by the much greater extent of blue coloration on the upperside of the hindwing; the markings of the underside also are very different."

"Described from a single specimen in the collection of Major C. T. Bingham, who captured it in December, 1887." (*de Nicéville*, l. c.)

The figure shows both sides of the male type specimen in Major Bingham's collection.

631. **Zarona zanella**, n. sp. (FRONTISPIECE, Fig. 125 ♀).

HABITAT: Upper Tenasserim.

EXPANSE: ♀, 1·45 inches.

DESCRIPTION: FEMALE. UPPERSIDE, *both wings* fuscous. *Forewing* with the costa, the upper half of the discoidal cell, giving off a wedge-shaped process covering the disco-cellular nervules, the apex widely, the outer margin widely but decreasingly, and all the veins alone fuscous, the rest of the wing purple, the portion of that colour occupying the lower half of the cell with its anterior margin waved. *Hindwing* with a patch of purple in the middle divided by the fuscous veins. UNDERSIDE, *both wings* dull reddish-purplish. *Forewing* with a discal macular narrow line formed of linear spots rather darker than the ground from the upper discoidal nervule to the submedian nervure, two extremely indistinct marginal fasciæ. *Hindwing* with a discal fascia as in the forewing, but highly irregular, the marginal fasciæ as in the forewing, a small round black spot a little removed from the margin in the submedian interspace. *Cilia* reddish-ochreous throughout.

I can compare this plainly-coloured simply-marked butterfly with no other; as far as I know it is quite unique, though it is possible that hereafter it may be proved to be the opposite sex of *Z. jasoda*, mihi, from which it differs in the much paler colour of the ground on the underside, in the discal band on the hindwing not being slightly outwardly marked with grey, and the grey irroration at the anal angle being absent. The type and only known specimen was taken in the Meplay Valley, Upper Tenasserim, Burma, on the 8th January, 1882, by Major C. T. Bingham.

The figure shows both sides of the type specimen in my collection.

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* *Zarona? pharyge*, Hewitson. *Poritia pharyge*, Hewitson, Trans. Ent. Soc. Lond., 1874, p. 345; idem, id., Ill. Diurn. Lep., p. 215, n. 5, pl. lxxxviii, figs. 8, 9, *male* (1878); id., Distant, Rhop. Malay., p. 450, n. 8, pl. xli, fig. 8, *male* (1886). HABITAT: Perak, Borneo. EXPANSE: 1·15 to 1·35 inches. DESCRIPTION: "MALE. UPPERSIDE, *both wings* black, marked by bands and spots of green. *Forewing* with a band from the base and on the inner margin, a trifid spot near the costal margin, and a submarginal series of five spots. *Hindwing* with a band near the inner margin, two spots beyond the middle, and three on the outer margin. UNDERSIDE, *both wings* rufous-brown. *Forewing* with a spot before the middle, a linear broken band at the middle, and a submarginal band of indistinct, brown spots. *Hindwing* crossed beyond the middle by three bands of spots, a linear blue band on the outer margin." (*Hewitson*, l. c.) MALE. "UPPERSIDE, *both wings* blackish, with the following bluish-green markings. *Forewing* with a longitudinal fascia along the median nervure, a curved fascia on base of inner margin, three subapical spots and a marginal series of six spots. *Hindwing* with a longitudinal fascia along the submedian nervure, two discal and three marginal spots, costal area brownish. UNDERSIDE, *both wings* brownish. *Forewing* with a dark linear disco-cellular spot, followed by two linear fasciæ crossing the wing which are more or less margined with greyish. *Hindwing* with a dark linear disco-cellular spot, two discal narrow waved dark fasciæ more or less margined with greyish, a similarly-coloured and margined waved fascia extending from the third median nervule to the anal angle, and a marginal narrow bluish and black fascia at the same area." (*Distant*, l. c.)

I have not seen this species. It would be interesting to know whether or not it possesses four subcostal nervules to the forewing; Mr. Distant placing it in the genus *Poritia* and not in *Deramas* would appear to show that it has three only.

Z bradamante, Doherty, MS , occurs in Lower Siam. Its description is appended.* It was drawn up from a single specimen. All the species of the *Poritia* group occurring in the Malay Peninsula seem to be extremely rare.

I append as a foot note† a description of the genus *Deramas*, Distant, which belongs to the *Poritia* group This group is a very small and interesting one it would be very desirable to monograph it, and to place in their proper genera the various species which have been described as *Poritia*, but which do not belong to that genus.

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* *Zarona bradamante*, n. sp , Doherty, MS HABITAT Lower Siam EXPANSE · Not given DESCRIPTION · " MALE UPPERSIDE, *both wings* black, basal part of forewing and half the hindwing bright bluish green, the tint varying in different lights (This is caused by the scales being slightly bent downwards at the end, the basal three-fourths being green the terminal fourth blue Viewed from certain directions only the blue tips of the scales are visible , from others, only the green bases) This green space occupies the lower part and end of the discoidal cell, the basal part of the median interspaces, the interno median interspace where it projects to one-fifth from the margin, and the interspace from the submedian nervure to the inner margin, not extending so far outwards , an oblique dark streak in the green in the middle of the interno median interspace, and a longer one along its upper edge , the veins slenderly black *Hindwing* has the green colour extending over most of the disc from the second subcostal nervure to the submedian nervure, marginal line black, the discoidal cell powdered with green basally , a black submarginal transverse streak in the interno median interspace, the veins not perceptibly black , abdominal margin clothed with long hairs *Cilia* black UNDERSIDE, *both wings* ground dark rufous brown with a slight violet lustre paler outwardly, a transverse discal line of darker streaks bordered outwardly with paler, the three upper streaks on the forewing placed beyond the line of the others, those on the hindwing placed very irregularly , an obscure series of paler lunules somewhat irregular on the hindwing, that in the interno median interspace broadly sagittate enclosing a white powdered spot a paler line close to the margin , marginal line anally on the hindwing black, inwardly defined with whitish *Cilia* rufous PREHENSORES, seen from the side *Uncus* quadrate, the angles rounded, branches very slender hooked at the tip, angled in the middle *Clasps* irregularly quadrate at the end, the lower angle acute, a long hirsute process or beak deflexed at the tip, proceeding from the upper angle above the base of which is a tubercle '

"One male, taken in deep forest at Kulim, State of Kedah, Lower Siam, not much above the sea level It differs from *Deramas livens* Distant, in the colour of the upperside, which is bluish green instead of 'dark cerulean blue, in the colour of the underside which is dark rufous brown instead of 'pale brownish ochraceous, suffused submarginally with grey, in the presence of the two black marks on the forewing above and in the absence of the sexual tuft ' (*Doherty*, MS)

Mr Doherty placed this species in Mr Distant's genus *Deramas*, but as that genus possesses a tuft of hairs in the male which is lacking in *bradamante*, I have thought it better to place it in *Zarona*, mihi Mr Doherty gives the following description of the structural characters of his type specimen of *bradamante* These differ in several particulars from the two species I have placed in *Zarona*, and hence it appears to me probable that *bradamante* should have made the type of a new genus

' Forewing with the costa strongly convex at base, thence straight nearly to apex, not emarginate in the middle as in *Poritia*, Moore , apex rather acute , outer margin slightly convex, inner margin strongly convex near the middle , costal nervure thickened, strongly bent in the middle ending two fifths before the apex , the first subcostal nervule short, slender originates one third before the end of the discoidal cell anastomoses with the costal nervure not far from its origin and does not again separate from it second subcostal from one sixth before the end of the cell third subcostal originates at two fifths of the distance between the cell and the apex , fourth subcostal thence halfway to the apex , upper discoidal nervule from the upper angle of the cell , middle disco cellular nervule less than one third as long as the lower , median nervules with their bases remote from each other, the second median originating well before the end of the cell submedian nervure straight , discoidal cell widest two thirds from the base, the end regularly concave Hindwing elongate, triangular, the costa, apex and anal angle rounded, the outer margin nearly straight for some distance, no tails , costal nervure robust at base, strongly bent beyond it, not attaining the apex , first subcostal nervule originates considerably before the end of the cell , second median nervule from its end upper disco-cellular nervule half as long as the lower , discoidal cell with its end oblique internal nervule rather long Antennæ rather thick, gradually clavate, the end abrupt, articulations about forty four Palpi with the last joint one third as long as the preceding one, slender, acicular, with few scales Eyes naked Hindlegs with the first joint of the tarsus enlarged thicker and about as long as the tibia, longer than the other joints united, the pulvillus very broad Forelegs as in *Massaga*, Doherty the tibiæ and tarsi thicker, the tarsi less clavate, with longer spines, not articulate " (*Doherty*, MS)

† Genus DERAMAS, Distant

Deramas, Distant, Ann and Mag of Nat Hist , fifth series, vol xvii, p 252 (1826); idem, id., Rhop. Malay , p 450 (1886)

' Closely allied to *Poritia*, Moore FOREWING, differs in possessing five instead of four subcostal nervules ; *first subcostal nervule* very short, emitted at about one-third before the end of the discoidal cell, and joins the costal nervure , *second* subcostal emitted nearer first than third , *third* subcostal from the end of the cell ; *fourth* subcostal bifurcating from third at about half its length , *fifth* subcostal bifurcating from third about midway between the base of the fourth and the apex of the wing " (*Distant*, l. c in Rhop Malay.)

As far as is known but a single species comes into this genus *D livens*, Distant, is described as possessing a cellular tuft of long hairs on the upperside of the hindwing in the male It is recorded from Singapore On the upperside the lower discal area of the forewing occupying rather less than one-third the total area of the wing and the disc of the hindwing are rich blue , the underside is very inconspicuously marked.

Deramas livens, Distant, Ann and Mag of Nat Hist , fifth series, vol xvii, p 252 (1886); idem, id., Rhop Malay , p 451, n 1, pl xlii, fig 15, *male* (1886) HABITAT · Singapore EXPANSE · *Male*, 1·2 inches. DESCRIPTION " MALE. UPPERSIDE, *both wings* dark cærulean blue. *Forewing* with the neuration, the costal, cellular, and apical areas outer margin narrowly, to outer margin, and inner margin narrowly, dark fuscous. *Hindwing* with a cellular tuft of long hairs , costal and abdominal areas, posterior margin, and a more or less continuous series of marginal spots placed on the nervules dark fuscous. UNDERSIDE, *both wings* pale brownish-ochraceous, with a narrow, linear, much waved and dislocated castaneous fascia, between which and the outer margin the colour is much suffused with greyish *Hindwing* with a short, narrow, strongly waved linear blackish fascia at the anal angle *Body* and *legs* more or less concolorous with the wings " (*Distant*, l c, in Rhop Malay)

Genus 100.—Poritia, Moore. (PLATE XXVI).

Poritia, Moore, Proc. Zool. Soc. Lond., 1865, p. 775; id., Hewitson, Ill. Diurn. Lep., p. 213 (1878); id., Distant, Rhop. Malay., p. 197 (1884); *Simiskina*, Distant, Entomologist, vol. xix, p. 12 (1886); idem, id., Rhop. Malay., p. 450 (1886): *Massaga*, Doherty, Journ. A. S. B., vol. lviii, pt. 2, p.   (1889).

"WINGS, short, very broad. FOREWING, with the costa slightly concave in the middle; *outer margin* straight, slightly oblique [convex in the female], *inner margin* nearly as long as the costa, *inner angle* acute; *subcostal nervure* with its first branch arising at one-third from its base and extending to the costa beyond one-third of its length, third remote, fourth arising from the second at one-fourth of the length of the first. HINDWING, very convex near the base, concave in the middle; *apex*, *exterior margin*, and *anal angle* rounded, scalloped. *Eyes* naked; *palpi* long, third joint slender, one-third the length of the second, finely pointed at the tip; *antennæ*, slender at the base, club moderate; *legs* short, stout, femora slightly pilose beneath; *thorax* stout; *abdomen* moderate, extending to two-thirds of the length of the hindwing." (*Moore*, l. c.)

"WINGS, short and broad. FOREWING, with the *costal margin* slightly concave about the middle, *outer margin* oblique, nearly straight or slightly rounded, *inner* margin slightly concave at the base, and then sinuated to outer angle (prominently in the male and obscurely in the female); *first subcostal nervule* emitted at about one-third from the end of the cell, *second* near end of cell, *third* emitted a short distance from apex of second.* HINDWING, convex at base, and suddenly oblique to apex [in the male]; *posterior margin* rounded and convex; provided in the male with a long tuft of hairs near the base of the cell *Eyes* naked; *palpi* long, the apical joint slender and pointed at apex; *legs* stout, femora pilose beneath; *antennæ* gradually increasing in thickness from the base, and terminating in a somewhat long and moderately thickened club; *thorax* robust."

"The species of *Poritia* exhibit a brilliancy of colour and markings which forcibly remind a lepidopterist of the glories of the Neotropical *Erycinidæ* [= *Nemeobiinæ*.] The genus was founded by Mr. Moore for the reception of a N.-E. Indian species, but *Poritia* has since been shown, and principally by Mr. Hewitson, to have its head-quarters and to reach its maximum of species in the Indo-Malayan region Some thirteen species are described, and of these no less than eight are found in [the Malay Peninsula] fauna" (*Distant*, l. c.)

In the type species of this genus, *P. hewitsoni*, Moore, the costa of the forewing is slightly emarginate near the middle; the outer margin is slightly convex; the first subcostal nervule arises just before the second, and almost immediately runs into the costal nervure, with which it entirely anastomoses and from which it does not subsequently become free, the amalgamated vein being long, ending on the costa considerably beyond the apex of the cell; the second arises about one-third before the apex of the discoidal cell and reaches the outer margin exactly opposite the origin of the third subcostal; this latter being very short, and arising about two-thirds beyond the apex of the cell. There are, therefore, three distinct subcostal nervules to the forewing in the type species, exclusive of the terminal portion of the subcostal nervure, which Mr. Distant counts as an additional subcostal nervule. Neither of the three authors† who have examined the neuration of this genus seem to have discovered the first subcostal nervule, which owing to its shortness and complete anastomosis with the costal nervure, except in a short free basal portion, might be easily overlooked. Upper disco-cellular nervule short, one-third the length of the lower disco-cellular, straight; second median nervule given off some distance before the apex of the cell. In the male, in the forewing, on the underside, there is a large somewhat quadrate shining patch of differently-formed and large scales from the inner margin to the median nervure near the base of the wing, and on the hindwing on the upperside another patch of scales of the same shape from the subcostal nervure to the costa. In the hindwing the costal nervure is strongly arched near its base and very short, the upper disco-cellular nervule is straight, outwardly oblique, and considerably shorter than the lower disco-cellular, the second median nervule given off immediately before the end of the cell. The males possess on the upperside of the hindwing a second tuft or pencil of long black hairs which have hitherto been overlooked, springing from near the base of the submedian nervure, and lying along the abdominal margin, the basal area of which margin from the submedian nervure to the margin is furnished with a patch of scales similar to those on the costa of the hindwing and inner margin of the forewing

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* "Mr. Moore describes the subcostal nervules as four in number; Mr. Hewitson corrects Moore, and says there are but two [one of Mr. Moore's subcostal nervules being the upper discoidal nervule]; according to my view there are three." (*Distant*, l. c.)

† I find that Mr. Distant in the Appendix to his 'Rhopalocera Malayana,' p. 450, has the following note:—"In my diagnosis of this genus, I stated that, 'according to *my* view there are three' subcostal nervules to the forewing. Mr. Moore has since pointed out to me that there are four, the first being very short and minute."

Six species of this very beautiful genus occur within Indian limits, the males of all of which have the upperside of both wings black, with patches varying in size and shade of rich blue or green The female of one species, *P. hewitsoni*, Moore, has a few blue and ferruginous spots on the upperside of both wings; another, *P. phraatica*, Hewitson, has ferruginous patches only; a third, *P pleurata*, Hewitson, is nearly as blue as the male, but the shade of colour is much lighter, and does not usually change with the incidence of the light, and there are two series of black lunules near the outer margin of the hindwing. The underside of both sexes of these three species is pale brownish, with very numerous closely arranged bands of black or ferruginous-outlined spots. The other group, which also contains three species, has the markings of the underside in both sexes quite different; the ground-colour is more or less ferruginous, and the markings, instead of being closely arranged annular bands, consist of narrow dark linear bands in two species; the third species has a broad white band The female of *P. harterti*, Doherty, is unknown, as also is that of the allied *P phalena*, Hewitson, from Singapore; the female of *P potina*, Hewitson, is bright orange, the apex and outer margin of the forewing on the upperside broadly black, the hindwing more or less marked with black; the female of *P pediada* is, if possible, even more aberrant than that of *P. potina*, being entirely fuliginous on the upperside. Mr. Distant has proposed a new genus and a new species for the female of *P potina*, calling it *Simiskina fulgens*, and placed the species in the subfamily *Nemeobiinæ* next after the genus *Abisara*, Felder * As far as I know every butterfly of the family *Nymphalidæ* has a præcostal nervure to the hindwing, while every species of the family *Lycænidæ* lacks this vein; by this one character I believe the two families to be invariably separable This vein is wanting in *Simiskina*. Mr. Doherty ignores Mr Distant's most inadequately-described genus *Simiskina*, and proposes a new genus *Massaga* for *P. harterti*, *P. potina*, and *P. pediada*; his description will be found below in a foot note †

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* Genus *Simiskina*, Distant, Entomologist, vol xix, p 12 (1886), idem id, Rhop Malay, p 450, (1886) "This genus differs from *Abisara*, Felder, in having the lower disco-cellular nervule of the HINDWING much longer than the upper thus resembling *Stiboges* Butler, but from that genus it is easily distinguished by the subcostal nervules of the hindwing, which bifurcate before the upper end of the cell In shape of wings and general superficial features *Simiskina* resembles *Abisara* (*Distant*, l c in Rhop Malay) Dr Staudinger agrees with Distant in considering this genus to belong to the *Nemeobiinæ* (Ex Schmett, p 275 (1888)

† Genus *Massaga*, Doherty, Journ A S B, vol lviii, pt 2, p (1889) "FOREWING, *upper discoidal nervule* originates a little beyond the cell, so that there is no trace of an upper disco-cellular nervule [in the *Lycænidæ*, according to my views, there is never any upper disco cellular nervule], the *middle* disco-cellular nervule is rather stout and oblique, the *lower* disco-cellular distinct, sinuous. HINDWING, *discoidal cell* longer than in *Poritia*, Moore, *upper disco-cellular nervule* short, very oblique *lower* disco-cellular long, *second median* nervule originates considerably before the lower end of the cell On the underside the ring markings of *Poritia* are replaced by simple transverse lines. The apex of the forewing is more pointed and is usually slightly falcate in both sexes, the upper part of the outer margin being slightly excised The tuft of the male is inconspicuous in itself, but is placed on a conspicuous ochreous patch The hindwing of the female is conspicuously angled. The sexes are exceedingly unlike The genus is close to *Deramas*, Distant, and *Zarona*, de Nicéville, which it greatly resembles, but differs in having one subcostal nervule the less in the forewing" (*Doherty*, l c)

Mr. Doherty first described this genus in a paper sent to Calcutta for publication in 1886, this paper, however, never appeared As the genus *Simiskina* has been described so inadequately and is, moreover, placed in a wrong family and the type species based on a synonym, Mr Doherty considers that the laws of priority in this case should be ignored, and that his name *Massaga* should stand This is his description of the genus in that paper: "Allied to *Deramas*, Distant, but having three subcostal nervules to the forewing only FOREWING, *first subcostal nervule* anastomosed with the costal nervure just as in *Deramas*, *third* subcostal given off from the subcostal nervure three fifths from the cell to the apex, *upper discoidal* nervule given off from the subcostal nervure some distance beyond the apex of the cell, *middle disco cellular* nervule very short, *lower* disco-cellular

The genus *Poritia* is a particularly difficult one, as the males of several species appear to possess no constant characters by which to distinguish them; while the females, though variable, present considerable and well-marked differences. The blue markings in the female on the upperside when present are iridescent, as are those of the male, but to a rather less extent. All the species appear to be rare and but seldom caught in perfect condition.

The complete transformations of no species of the genus is known, but a description of the pupa of *P. harterti*, Doherty, will be found under the description of that species.

The genus appears to be strictly confined to the Indo-Malayan region. In India it occurs only in Sikkim eastwards to Assam, thence southwards through Burma to Singapore, several species being found in Sumatra, Java, and Borneo.

Key to the Indian species of Poritia.

A. Both sexes, underside, both wings closely covered with catenulated bands of annular spots.
  a. Female, upperside, both wings more or less marked with blue
    *a*¹. The blue coloration less extensive than the black, often with some ferruginous spots on the forewing.
      632. P. HEWITSONI, Kumaon, Sikkim, Assam, Chittagong Hill Tracts, Upper Burma, Tavoy.
    *b*¹. The blue coloration more extensive than the black, never with ferruginous spots on the forewing.
      633. P. PLEURATA, Burma, Malay Peninsula.
  b. Female, upperside, both wings with discal orange patches.
      634 P. PHRAATICA, Mergui, Malay Peninsula, Siam.
B. Both sexes, underside, both wings without annular markings, but with simple transverse lines.
  a. Male, underside, both wings with a broad white discal band.
      635. P. HARTERTII, Upper Assam.
  b. Both sexes, underside, both wings with no broad white discal band.
    *a*¹. Female, upperside, *both wings orange, with black outer margins.*
      636 P POTINA, Tenasserim Valley, Penang, Malacca, Singapore.
    *b*¹. Female, upperside, both wings fuliginous, immaculate.
      637. P. PEDIADA, Tenasserim Valley, Singapore.

632 **Poritia hewitsoni**, Moore.

P. hewitsoni, Moore, Proc. Zool. Soc. Lond., 1865, p 775, pl. xli, fig. 10, *male*; id., Hewitson, Ill. Diurn Lep., p. 214, n. 1, pl lxxxviii, fig. 1, *female* (1878); id, Staudinger, Ex. Schmett., p. 275, pl. xcv, *male* (1888); *P. hewitsonii*, var. *tavoyana*, Doherty, Journ. A S. B, vol lviii, pt. 2, p. (1889).

HABITAT: Kali Valley at Garjiaghat, Kumaon; Sikkim; Bengal; Assam; Chittagong Hill Tracts; Upper Burma; Tavoy.

EXPANSE: ♂, 1·20 to 1·50; ♀, 1·40 to 1·60 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* jet-black. *Forewing* with the lower part of the base from beneath to beyond the cell and extending into the black of the exterior margin brilliant deep blue, or in some lights emerald-green, in the middle of which is an elongated black spot, a row of very small similar brilliant blue spots obliquely before the apex and along the exterior margin. *Hindwing* with the same brilliant blue extending

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deeply concave; *second median* nervule originates considerably before the lower end of the cell. HINDWING broad, *outer margin* scalloped, *costal nervure* shorter than in *Deramas*, ending considerably before the apex of the wing; *second subcostal nervule* originates considerably before the end of the cell, *second median* nervule even more so; *discoidal cell* with its end truncate, not oblique; *upper disco-cellular nervule* oblique, hardly half as long as the lower; *lower disco-cellular* regularly and strongly incurved *Antennæ* more slender than in *Deramas*, the club more distinct; *palpi* with the last joint still longer and more slender and acute. *Hind legs* with the first joint of the tarsi not perceptibly swollen. *Fore legs* with the femur enlarged, longer than the tibia; tarsus hardly two-thirds as long as the tibia, clavate, not articulate, with a few short spines, claws small, slender, partially concealed, accompanied by the usual hairs, but with no paronychia. *Middle* and *hind legs* with five distinct joints, claws, paronychia, and pulvillus. Male with a tuft of long hairs on the upperside of the hindwing in the cell. This description is based on a single male of *M. clorinda*." Thus MS. species is the male of *P. potina* Hewitson.

As Mr. Doherty describes his genus *Massaga* in comparison with *Poritia*, I give his definition of the latter. "In this genus the upper discoidal nervule of the forewing originates at the end of the discoidal cell, so that there is a very short upper disco-cellular nervule; the middle disco-cellular is upright and very slender; the lower disco-cellular obsolescent. In the hindwing the disco-cellular nervules are also very slender, the upper rather long; the second median nervule is given off opposite to the lower end of the cell. The apex of the forewing is rather rounded, the upper part of the outer margin being strongly rounded. . The markings of the underside are annular and exceedingly variable. The sex mark at the base of the hindwing of the male is a conspicuous tuft of black hairs on a dark ground. The hindwing of the female is less angled outwardly than in *Massaga*." (Journ. A. S. B., vol. lviii, pt. 2, p. (1889).

from the base beneath the cell (in some specimens encroaching within) to the exterior margin, within which is a row of more or less defined marginal and submarginal black spots, exterior-margin defined by a black line, abdominal and anterior margins greyish-black, a tuft of fine greyish hairs near the base. *Thorax* above greenish-black; *abdomen* black; *antennæ* black, ringed with white; *head* and *palpi* above hoary; palpi and *thorax* beneath and *legs* white, tibiæ and tarsi with black spots. UNDERSIDE, *both wings* very pale ashy colour, covered with numerous transverse irregular-shaped black-bordered pale brown markings, those at the base short, a series across the disc zigzag, others along the exterior margin with narrow inner white lines, posterior angle of both wings with a black spot bordered above with orange-red. FEMALE. UPPERSIDE, *both wings* brownish-black *Forewing* with a pale orange-yellow streak in the middle, above and beneath which are purple-blue connected streaks. *Hindwing* with ill-defined purple-blue marginal and discal spots, exterior margin defined by a very narrow yellow line, which is bordered within by a similar white line. *Cilia* in both sexes alternate brown and white." (*Moore*, l. c) The extent of the blue area of the upperside in the male is very variable in different Sikkim specimens. In one extreme the elongated black spot in the submedian interspace in the forewing is entirely absent, as are also the marginal- and submarginal black spots on the hindwing. The underside of both wings in both sexes of Sikkim specimens varies much in the ground-colour, being in some specimens pale ochreous-white, in others ashy; the prominence of all the markings is also very variable. It occurs in Sikkim in October and November. I have received specimens also from Sibsagar in Upper Assam taken by Mr. S. E. Peal, from the Chittagong Hill Tracts taken by the late Mr. H. M. Parish in November, and one female from Tsenbo in Upper Burma taken by Major C. H. E Adamson in May.

Mr. W. Doherty has given me the following description of the egg of *P. hewitsoni*:—"Egg a truncate pyramid, half again as long as wide, with two vertical, two sloping, and two horizontal faces, reticulate above as is usual in the *Lycænidæ*. It is the most remarkable egg known to me among Butterflies, and I was particularly anxious to examine other species to see whether this form was constant or not. But although seven species of *Poritia*, all very conspicuously coloured, are described from the Malay Peninsula, I have not obtained a single specimen of any of them during my stay here [in Perak] from the middle of May to the middle of November. The seven known species were mostly taken at Singapore, though that locality would seem to be very unfavourable for rare insects on account of the absence of virgin forest."

Mr. Doherty has described a variety (or better, local-race) of *P. hewitsoni* under the name of *tavoyana* chiefly on the coloration of the upperside of the female as follows:—"Taken commonly at Myitta, Tavoy. The males are remarkably variable, many are wholly indistinguishable from those of *P. phraatica*, Hewitson. I have taken every variation from those resembling Mr. Distant's figure of *P. phraatica* to those with an irregular blue area below the cell, wholly separate from a long submedian streak and a solid oblique subapical band. The underside varies greatly, and does not differ from that of *P. phraatica*. The female is pale blue over fully one-third of the forewing, and has more resemblance to the male than to the northern female with its small blue area. In the Tavoy form this extends from the cell to the hind margin projecting in the interno-median interspace within one-eighth of the outer margin; there is a blue spot in the cell, and a variable subapical band sometimes obsolete. The ochreous discal spot of the forewing is occasionally present. The blue area on the hindwing is variable but usually considerable." (*Doherty*, l. c.)

633. **Poritia pleurata,** Hewitson. (PLATE XXVI, FIG. 160 ♀).

P. pleurata, Hewitson, Trans. Ent. Soc. Lond., 1874, p. 346: idem, id., Ill. Diurn. Lep, p. 215, n. 3, pl. lxxxviii, figs 3, 4, *male*; 5, *female* (1878); id., Distant, Rhop. Malay., p. 199, n. 3, pl. xxii, fig. 6, *male*; 7, *female* (1884).

HABITAT: Meplay Valley, Thoungyeen Forests (*Bingham*); Karen Hills (*Phayre Museum, Rangoon*); Singapore (*Hewitson*).

EXPANSE: ♂, 1·35 to 1·60; ♀, 1·20 (*Hewitson*), 1·6 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* brilliant blue. *Forewing* with the costal margin and apical half, which is marked by two blue spots, dark brown. *Hindwing* with the costal margin broadly brown; the outer margin black, spotted with white. UNDERSIDE, *both wings* white, crossed everywhere by rufous bands and spots, and marked near the outer margin by a series of singularly formed spots. *Forewing* with a black spot at the anal angle. *Hindwing* with three black spots, the spot nearest the anal angle crowned with orange." (*Hewitson*, l. c. in Trans. Ent. Soc. Lond.) "FEMALE. UPPERSIDE, *both wings* cerulean-blue, clouded at the base. *Forewing* with the apical half dark brown, crossed by five pale blue spots. *Hindwing* with the costal and outer margins dark brown, the outer margin marked by two black spots crowned with blue." (*Hewitson*, l. c. in Ill. Diurn. Lep.)

In the Phayre Museum, Rangoon, is a pair of what I consider to be this species from the Karen Hills, Burma, the male taken in February, the female in April, and in my own collection are numerous others from the same locality taken from February to April. The males agree very fairly on the upperside with Hewitson's figure, but the two subapical blue spots (in my specimens there are from three to five) described on the forewing are not shown. In the figure referred to there is a small black streak in the submedian interspace of the forewing, which is lacking in most of my specimens. The hindwing is entirely blue except the costal margin, which is black, and the abdominal margin, which is whitish; the outer margin is marked with a rather broad black line having a small irrorated indistinct black spot in each interspace within it, the cilia whitish. The shade of blue is a little lighter than in *P. hewitsoni*, Moore, but similarly changeable to brilliant emerald green in some lights. The underside of the males of my specimens differs from that figured by Hewitson in that all the markings are rather less prominent. The female differs entirely from that sex of *P. hewitsoni*, being a blue insect with some black markings on the upperside, instead of a black insect with some blue and orange markings. My specimen agrees very fairly with Hewitson's figure of that sex, but is much larger, the blue coloration paler than in the male, but brighter than in Hewitson's figure. The hindwing has the outer margin black divided by a narrow lunular blue line, with a fine rufous line on the margin, defined on both sides by still finer black and blue lines, the rufous line defined by black continued on to the margin of the forewing. The underside agrees very closely with the figure of the underside of the male by Hewitson. I also possess two more males which probably belong to this species, both taken by Major C. T. Bingham, one in the Thoungyeen Forests in April, the other in the Meplay Valley in January. They both have a single subapical blue spot on the upperside of the forewing, and one specimen has a series of irrorated submarginal black spots on the hindwing in addition to the marginal series. The undersides of these specimens are variable, one is marked prominently with blackish, the other with ferruginous, the latter agrees very well with Hewitson's figure.

The figure shows both sides of a female example from the Karen Hills, Burma, now deposited in the Phayre Museum, Rangoon.

634. **Poritia phraatica,** Hewitson

P. phraatica, Hewitson, Ill. Diurn. Lep., p. 214, n. 2, pl. lxxxviii, fig. 2, *female* (1878); id., Elwes and de Nicéville, Journ. A. S. B., vol. lv, pt. 2, p. 430, n. 102 (1886); id., Moore, Journ. Linn. Soc. Lond., Zoology, vol. xxi, p. 38 (1886); id., Distant, Rhop. Malay., p. 199, n. 2, pl. xxi, fig. 1, *male*, pl. xxiv, fig. 8, *female* (1884); *P. pleurata*, Hewitson, Trans. Ent. Soc. Lond., 1874, p. 346 (*female* only).

HABITAT: Mergui, Ponsekai, Province Wellesley, Singapore.

EXPANSE: ♂, 1·1 to 1·4; ♀, 1·25 to 1·40 inches.

DESCRIPTION: "MALE. Allied to the male of *P. sumatræ*, Felder, but larger, and with the black area of the *forewing* on the UPPERSIDE smaller, its inner margin somewhat concavely occupying the end of the cell, after which it is more or less convexly continued to the first median nervule, and is then marginally continued to the angle, where there is a short black streak along the submedian nervure. UNDERSIDE, *both wings* with the markings closely resembling those of *P. sumatræ*, but much paler in hue." (*Distant*, l. c.) "FEMALE.

UPPERSIDE, *both wings* rufous-brown *Forewing* with a large medial, oval, orange spot. *Hindwing* with a medial band and two submarginal spots orange, a marginal band of linear white spots. UNDERSIDE, *both wings* white, crossed by several bands of pale brown spots. *Forewing* with a black spot at the anal angle. *Hindwing* with three submarginal black spots, and an orange spot near the anal angle." (*Hewitson*, l. c. in Ill. Diurn. Lep.) "FEMALE. UPPERSIDE, *both wings* rufous-brown. *Forewing* with a large orange medial spot. *Hindwing* with an oblique medial band and three spots of orange near the outer margin, a submarginal linear band of white. UNDERSIDE, *both wings* like the male [of *P. pleurata*, Hewitson], but less crowded with spots." (*Hewitson*, l. c. in Trans. Ent. Soc. Lond.)

"A pair of this pretty species from Ponsekai, Tavoy, so named by Mr. Moore. The male does not at all agree with Distant's figure of this species. It seems near the *P. sumatræ*, Felder, but is quite distinct." (*Elwes* and *de Nicéville*, l. c.)

"Three males and one female were collected by Dr. Anderson in the Mergui Archipelago. The female is identical with Mr. Hewitson's type, figured as above. One of the males has a broad lower basal cobalt-blue patch with an outer lobe protruding towards the posterior angle [in the submedian interspace], and a partly confluent curved series of subapical spots; and the lower half of the hindwing has a similar-coloured patch with a marginal row of blackish oval spots. In the other male the blue is of a decidedly ultramarine tint, and the patch on the forewing has a medial black streak. The markings on the underside of the males are exactly like those on the female" (*Moore*, l. c.)

As pointed out above, *P. phraatica* seems to be as variable a species in the male as *P. hewitsoni*, Moore. The extent and distribution of the blue coloration is the same in both species on the upperside, but whereas in *P. hewitsoni* it changes from blue to emerald-green in some lights, in *P. phraatica* this is never the case.[*] The female differs considerably from *P. hewitsoni*, as it has no blue markings whatever on the upperside; the extent of the orange markings is very variable, in some examples occupying half the surface. Both sexes are smaller also. I give below Mr. Distant's description of the female, as he has not described the typical form.[†]

In the Indian Museum, Calcutta, are four males and two females of this species from Mergui and Tavoy.

To judge from the character of the markings of *P. sumatræ*, Felder, as figured, it belongs to this group. The male has a single broad green streak on the inner margin of the forewing on the upperside, cleft at its outer end; the lower three-quarters of the hindwing green, the remainder of both wings black. The female is pale violet-blue on the upperside with black margins, bearing two series of spots of the ground-colour on the forewing; the outer ends of all the veins marked with yellowish. The underside is marked with numerous closely-placed bands, less annular than in *P. hewitsoni* and allies. Its description is appended.[‡]

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[*] Since the above statement regarding the unchangability of the coloration of the upperside of the male was written, Mr. Doherty assures me that this character is not a constant one, but that in Tenasserim he found changeless blue and changeable blue to green males of *P. hewitsoni*, var. *tavoyana* flying together, and that they almost certainly represent one species If this character breaks down, it appears that there is no other by which the males of *P. phraatica* can be distinguished from that sex of *P. hewitsoni*, Moore. Mr. Distant's figure of the male shews a green insect.

[†] "FEMALE UPPERSIDE, *both wings* bright ochraceous *Forewing* with the costal, outer and inner margins broadly dark brown. *Hindwing* with the basal half (notched posteriorly), a broad fascia occupying the margin from apex to the third median nervule, and then deflected transversely across the wing to a little above the anal angle, and three large conical marginal spots separated by the median nervules dark brown. UNDERSIDE, *both wings* as in the male, but much paler. The female specimen here figured is paler on the hindwing than depicted by Hewitson's figure, and is evidently a slight variety of the species."

[‡] *Poritia sumatræ*, Felder. *Pseudodipsas sumatræ*, Felder, Reise Novara, Lep., vol. ii, p. 259, n. 306, pl. xxxvi, figs. 24. 25, *male*; 26, *female* (1865); *Poritia sumatræ*, Hewitson, Ill. Diurn. Lep., *Lycænidæ*, p 218, n. 12 (1878); id., Butler, Trans. Linn. Sec. Lond., Zoology, second series, vol. i, p. 346, n. 1 (1877); id., Distant, Rhop. Malay., p 198, n. 1, pl xxii, fig. 2, *male*; 3, *female* (1884). HABITAT: Penang, Singapore, Sumatra EXPANSE: *Male*, 1·25; *female*, 1·40 inches. DESCRIPTION: "MALE. UPPERSIDE, *both wings* pale greenish-cyaneous, in certain positions vividly green *Forewing* with more than the anterior two-thirds and an anal vittula fuscous *Hindwing* with the costal border and the posterior margin before the cilia fuscous. UNDERSIDE, *both wings* hoary-brownish, with numerous ochraceous-fulvous markings circled with fuscous and arranged in fasciæ, and a submarginal series of rhombic spots paler than the ground, with fulvous pupils powdered with black FEMALE. UPPERSIDE, *both wings* pale violaceous-cyaneous, with fulvous-fuscous vittulæ near the tips of the inferior nervules. *Forewing* with the costal and

635. **Poritia hartertii,** Doherty.

P. hartertii, Doherty, Journ., A. S. B., vol. lviii, pt. 2, p. (1889).

HABITAT: Upper Assam.

EXPANSE: ♂, 1·3 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* black, markings seen from above lustrous sea-green, from any other direction more or less bluish; the tips of the scales being blue and slightly tilted downwards. *Forewing* with six submarginal spots, the upper five small and subequal, arranged in a linear series; the lower slightly nearer the base, oblong and much longer than the others; a slender oblique fascia beyond the cell, divided by the discoidal nervules into three parts, the lowest longest; a stripe along the lower side of the median nervure extending to the base, a small part of it lying beyond the first median nervule, which divides it; beyond this a wide transverse discal spot, divided by the second median nervule into two portions outwardly dehiscent; another stripe along the hind margin almost from the base, the outer end inclined upwards, with a minute spot above its termination, separated from it by the submedian nervure. *Hindwing* with a large pale costal area, a tuft of long hairs appressed in the direction of the apex placed on a gland which forms a raised elliptical line on the underside above the origin of the first subcostal nervule; four submarginal spots, a diffused one extending from the median nervure half-way to the submedian nervure; a large obliquely-semicircular one dark in the middle in the first median interspace, a narrow crescent close to the marginal black line in the third median interspace, and a small diffused spot in the next interspace, partly united with the upper discal spot; three discal spots, one occupying the submedian interspace from its base, constricted in the middle, the end clavate and occupying the whole breadth of the interspace, beyond this two spots of moderate size in the median interspaces discally. UNDERSIDE, *both wings* rufous-brown with a slight bluish gloss. *Forewing* with a broad white band beyond the cell from the costa (where it is narrowest) almost to the hind margin; beyond it a broad space of darker richer brown, then a row of seven delicate whitish transverse submarginal streaks, of which the upper three are most distinct, crescent-shaped; the others obscure and irregular; beyond these a paler space, with three whitish streaks, parallel with and close to the upper three of the inner series; margin chestnut brown; *cilia* chiefly light. *Hindwing*, basal part unmarked, a broad white band crossing the wing from the costa, occupying the outer third of the cell, its inner margin well-defined, and but slightly irregular; the disc is covered with large rufous-brown markings in two very irregular series; the first four (those above the discoidal nervule) on a white ground, the others on a ground obscurely clouded with violet and whitish scales; two of these spots in the inner series and the median interspaces are much larger than the others the outer one quadrate; a dark wavy outer discal line extends in a white ground to the third median nervule, where it is interrupted, and from there to the anal angle on a whitish ground; marginal line orange-brown, bordered inwardly by a silvery line, between which and the wavy discal line are, in the second median interspace, a blackish area, in the first median

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terminal border fuscous, this divided by two macular fasciæ of the ground-colour (the interior much shorter), and with a disco-cellular litura fulvous-reddish circled with blackish. *Hindwing* with the interior border palely fuscous, the external margin broadly fuscous, divided by lunules and an anteciliary streak of the ground-colour. UNDERSIDE, *both wings* as in the male, but the submarginal spots inwardly triangular."

"In many respects a very distinct species. The head is small, the eyes naked, the antennæ gradually clavated, the subcostal nervure of the forewing only two-branched, and the costal nervure of the hindwing short. The male has on the upperside of the hindwing along the cell-fold a tuft of fine hairs, and shows on the underside of the forewing, on the lower side of the median nervure, a shining spot thinly covered with scales. The costal margin of the hindwing is in this sex towards the base, widened out raggedly. (*Felder*, l. c.).

Poritia sumatræ, var. ? Distant, Rhop. Malay., p. 198, pl. xx, fig. 12, *female* (1884). HABITAT: Malacca. EXPANSE: *Female*, 1·5 inches. "This figure represents the female specimen collected by Capt. Pinwill and contained in the British Museum, which has been identified by Mr. Butler as belonging to Felder's species. The differences, however, between that author's figure and the specimen thus identified are so considerable that it is probable that the female of another species has been confused with that of Felder" (*Distant*, l. c.) The differences between these two figures are chiefly as follows:—In Felder's the ground-colour is much deeper blue, in Distant's it is pale violet; Distant's figure does not show the outer portions of all the veins bearing fulvous-fuscous streaks, this being a conspicuous feature in Felder's specimen; and on the underside the markings of Distant's specimen are wider, apparently fewer, and much less distinct than those shewn on the underside of Felder's male specimen; the only difference that Felder gives in the markings of the underside of both sexes is that in the female the submarginal spots are inwardly triangular. If Mr. Distant had fully described his specimen it would have been easier to judge whether it represented a species distinct from *P. sumatræ* or not.

interspace a grey area and thence to the anal angle a blackish line, inwardly bordered with reddish; *cilia* basally grey, outwardly dark."

"From *P. phalena*, Hewitson, from Singapore, of which it seems to be the northern representative,* it differs in the narrow streak below the cell in the forewing, with the bifid spot beyond it, and in the long mark in the hind margin. The hindwing below is quite different, much less white, the discal spots larger and of the general ground colour, the submarginal spots absent, and the apical rufous-brown space greatly reduced."

"The generic characters resemble those of *P. hewitsoni*, Moore. The left forewing has the first subcostal nervule rather more slender and further from the base of the second than in that species. In the right forewing the first subcostal nervule is wholly absent. This interesting aberration may be of frequent occurrence in this group, and may have been the cause that Moore, Hewitson, Felder and Distant passed over this vein in their descriptions of the genus."

"The egg probably agrees with that of the other species of the subfamily. It is a truncate pyramid nearly twice as long as wide, with two vertical and two sloping sides, the former trapezoidal, reticulate near their upper edges; the latter and the apex nearly square, delicately reticulate. In the ovarian tubes of the female, these eggs are found in pairs, attached by their bases. Along with those of *Iaphyra brassolis*, Westwood, they are the most remarkable eggs in the family."

"The chrysalis somewhat resembles those of the *Erycinidæ* [= *Nemeobiinæ*] and strikingly illustrates the singularity of the group. It is suspended, not girt, but rigidly inclined towards the surface of the leaf. It is less compact in form than that of other *Lycænidæ*, and is studded with bristles. Of these a number on the side of the head are white, with two black ones on each side of the top of the head, and one black one on each side of the thorax above the thoracic angle. The second, third, and fourth abdominal segments have each a lower white and an upper black bristle approximate laterally; while the last segments have a number of white lateral and of black subdorsal ones. The ground colour is ochreous much marked with dark, especially on the upper surface of the abdomen, each segment having a black line near its hind margin, except the first which has two distinct black spots dorsally. The wing-covers are veined and bordered with brown."

"I name this species for my fellow traveller in Assam, Lieutenant Ernst Hartert, the ornithologist and African traveller, who obtained the sole specimen." (*Doherty*, l. c.)

636 **Poritia potina,** Hewitson.

P. potina, Hewitson, Trans Ent Soc Lond, 1874, p. 347, idem, id, Ill Diurn Lep, p. 215, n. 4, pl. lxxxviii, figs 6, 7, *female* (1878), id, Distant, Rhop Malay, p. 201, n. 7, pl. xxii, fig 7, *female* (1884), *Massaga potina*, Doherty, Journ. A S B, vol. lviii, pt 2, p. (1889), *Simiskina potina*, Staudinger, Ex Schmett, p. 275, pl. xcv, *female* (nec *male*) (1888), *Simiskina fulgens*, Distant, Entomologist, vol xix, p. 12 (1886), idem, id., Rhop Malay, p. 450, n. 1, pl. xlii, fig 3 *female* (1886).

HABITAT: Tavoy, Perak, Penang, Malacca, Singapore.

EXPANSE: ♂, 1·3; ♀, 1·4 to 1·6 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* velvety black, with the following rich blue markings varying according to the light.—one below the cell, clavate, extending widely into the [bases of the] median interspaces; one below the submedian nervure with a spot above th end of it; a series of three spots a little beyond the end of the cell, the upper obscure, the lowes quadrate a submarginal series of six spots, the lowest large and cordate. *Hindwing* with longitudinal mark in the interno-median interspace, from the base two-thirds to the outer margin; two discal spots in the next two interspaces; three marginal crescents in these three interspaces, the subanal one large, with a streak alongside of it beyond the submedian nervure. UNDERSIDE, *both wings* rufous-brown, brighter than in *P. pediada*, Hewitson. *Forewing* with an obscure darker rufous streak across the end of the cell, a darker rufous line across the disc as far as the first median nervule, bordered outwardly by a darker bluish-tinged space, an outer-discal obscure lunular line bordered inwardly by a paler bluish line, and outwardly by a broad pale space, which is conspicuous and somewhat ochreous near the apex; inner margin and interno-median interspace chiefly dull ochreous, shining; a bright reddish marginal line; *cilia* blackish. *Hindwing* with the base and costa dark rufous-brown, the rest paler rufous; a brighter rufous streak closing the cell; a similar discal series of lunules irregularly placed, an obscure dark outer-discal lunular line, obsolete subapically, bordered both inwardly and outwardly by a paler bluish space, and then by a brighter rufous space; a bright rufous marginal line bordered subanally by slender black and white lines; *cilia* dark." (*Doherty*, l. c.) "FEMALE. UPPERSIDE, *both wings* orange. *Forewing* with the apex, the outer and inner margins, and a linear spot at the end of the cell, dark brown. *Hindwing* angular a little below the apex [at the termination of the third median nervule], clouded with rufous-brown, and marked by three large brown spots near the outer margin. UNDERSIDE, *both wings* rufous, tinted with lilac, a linear spot at the end of the cell; crossed before the middle by a rufous-brown band (broken into spots on the hindwing), crossed beyond the middle by two bands (near together) of the same colour." (*Hewitson*, l. c. in Trans. Ent. Soc. Lond.)

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* *Poritia phalena*, Hewitson, Trans Ent Soc Lond, 1874, p. 344, idem, id, Ill Diurn Lep, p. 216 n. 8, pl. lxxxix figs 14, 15, *male* (1878), id, Distant, Rhop Malay, p. 200, n. 4, pl. xxii, fig 8, *male* (1884) HABITAT: Singapore. EXPANSE: *Male*, 1·4 inches. DESCRIPTION: "MALE. UPPERSIDE, *both wings* black marked by bands and spots of green. *Forewing* with a longitudinal narrow band from the base to the middle a band (bifid spot) on the inner margin, a trifid spot near the costal margin, and a submarginal series of six spots *Hindwing* with a band near the inner margin, two submarginal spots, and three spots on the outer margin; on of them, which is at the anal angle, large, and marked by a black spot. UNDERSIDE *both wings* rufous-brow *Forewing* crossed at the middle by a band of white, and beyond it by a series of five grey spots. *Hindwin* white, with the base and apex rufous-brown, several small brown spots near the middle, followed by three large spots of the same colour, four large marginal spots, their centres and borders black." (*Hewitson*, l. c., in Trans. Ent Soc Lond.)

This species must be very rare, none seem to have been obtained since Mr Wallace procured the type.

"One male and five females (only one fresh) taken near Myitta, in the Tavoy district. The male differs from the male of *M.* [= *P.*] *pediada*, Hewitson, in having the markings [on the upperside] larger, clearer, and not bluish-green, but blue [in all lights]. The underside is less dark and uniform. Both sexes are more falcate than in *M. pediada*, and of larger size. The female generally sits on a leaf with half-open wings, and might easily be taken for a small *Cirrhochroa* or sometimes for a *Loxura*. In any case its entire departure from the usual colours of the group indicate that it is likely to prove a mimic. The female is somewhat variable. I have no doubt that it will turn out to be conspecific with *P. potina*, from the Malay Peninsula, which I only know by Hewitson's figure. It seems also probable that the species named by Mr. Distant *Simiskina fulgens*, and placed by him in the *Erycinidæ* [= *Nemeobiinæ*] is identical with or at least very closely allied to this species. Unfortunately he gives no description of the genus, merely noting two particulars in which, it is true, it differs from all Eastern *Erycinidæ*, but agrees with the *Poritias* and most other genera of the *Lycænidæ*. His figure faithfully represents a rather worn and faded example of this species."

"The egg of *M. potina* differs from that of *Poritia* in having the hexagonal reticulations very regular and delicate; it has the same extraordinary shape. It differs wholly from the eggs of the Eastern *Erycinidæ* which are all round in horizontal section and without the slightest trace of reticulation." (*Doherty*, l. c.)

I give below Messrs. Distant and Doherty's descriptions of the female of this species.*

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* FEMALE. "UPPERSIDE, *both wings* bright ochraceous. *Forewing* with the apex, the outer and inner margins, broadly dark brownish, with a narrow linear disco-cellular spot of the same colour. *Hindwing* with the cellular area, the whole area between the cell, the third median nervule, and the abdominal margin, and a broad outer macular margin, dark brownish. UNDERSIDE, *both wings* pale ochraceous, with linear pale castaneous disco-cellular spots, a much-waved castaneous fascia crossing the wings beyond the cells, recurved, and terminating on the abdominal margin of the hindwing; two fainter outer discal fasciæ, the outermost of which is blackened on the hindwing. *Hindwing* with the outer margin pale castaneous, preceded by two dark linear fasciæ. *Body* above fuscous, beneath more or less concolorous with the wings." (*Distant*, l. c.)

"FEMALE. UPPERSIDE, *both wings* bright orange-tawny, the apex and outer margin (not the costa) widely blackish; the ends of the three median nervules and the submedian nervure brown or even orange, the orange area almost semicircular outwardly; the inner margin and the basal half of the interno-median interspace is usually more or less irrorated with black scales, which also enter the base of the discoidal cell; a marginal rufous line; *cilia* darker. *Hindwing* orange, generally strongly irrorated with black, the veins less so; an obscure submarginal band of darker quadrate spots; a rufous marginal line, some specimens have almost the whole upper surface orange except the apex and outer margin of the forewing; *cilia* darker. UNDERSIDE, *both wings* light rufous-brown, much paler than in the male, the markings darker ferruginous, resembling those of the male, but more distinct." (*Doherty*, l. c.)

In 1886, Mr. Doherty described this species in MS. from a male specimen from the town of Thaiping, 1,000 feet elevation, Perak, under the name of *Massaga clorinda*. He gave the following structural details of the

637 **Poritia pediada,** Hewitson.

P. pediada, Hewitson, Ent. Month. Mag., vol. xiii, p. 223 (1877); idem, id., Ill. Diurn. Lep., p. 218, n. 11, pl. lxxxix, figs. 21, 22, *female* (1878); id., Distant, Rhop. Malay., p. 200, n. 6, pl. xxii, fig. 16, *female* (1884); *Massaga pediada*, Doherty, Journ. A. S. B., vol. lviii, pt. 2, p. (1889).

HABITAT: Mergui, Singapore.

EXPANSE: ♂, 1·2; ♀, 1·1 to 1·5 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* velvety black. *Forewing* with the following rich bluish-green markings, varying according to the light:—one below the cell, clavate; one basal, below the submedian nervure, its terminal part crossing the nervure; one a little beyond the cell, oblique, consisting of three quadrate spots; a submarginal row of six spots, the last larger, subcordate. *Hindwing* with a longitudinal mark in the internomedian interspace from the base united terminally with the inner of a row of three triangular spots crossing the disc; three submarginal spots in the same spaces as the discal spots, the middle spot small, lunular, the two outer spots semi-circular, enclosing black spots, the subanal one largest. UNDERSIDE, *both wings* dull rufous-brown with a pale violet gloss. *Forewing* with a broken macular line of minute whitish spots across the disc, an outer-discal line of small and very obscure pale lunules, beyond which lies a pale band, the margin brighter rufous. *Hindwing* with the base and costa dull rufous-brown, most of the rest irrorated with whitish scales, an obscure darker transverse [discal] line with two sagittate marks in the median interspaces, a submarginal dark zigzag line bordered inwardly by a pale line; a marginal bright reddish line bordered inwardly by slender black and white lines which do not extend to the apex." (*Doherty*, l. c.) "FEMALE. UPPERSIDE, *both wings* dark brown, slightly tinted with dull blue. *Hindwing* with the outer margin dentate near the middle, traversed from the dentation to the anal angle by a pale blue line. UNDERSIDE, *both wings* red-brown, crossed transversely by two bands of lilac-white, one near the middle, the other submarginal. *Hindwing* with a short band of the same colour between the others, and a submarginal line of white." (*Hewitson*, l. c. in Ill. Diurn. Lep.)

Mr. Doherty obtained a pair of specimens of this species at Mergui, Burma, in the cold weather. The female differs from Hewitson's type specimen in lacking on the upperside of the hindwing the pale blue line from the dentation to the anal angle, and the underside of the Mergui specimen can hardly be said to be traversed by two bands of lilac-white. The species, however, is probably variable. I append as a foot-note Mr. Doherty's description of his female specimen.* The disposition of the markings of the males on the upperside in *Poritia* (*? Zarona*) *pharyge*, *P. hartertii*, *P. phalena*, *P. potina*, *P. pediada*, and *P. phalia* (Hewitson, from Borneo), is practically the same, and is quite different from that of the other species of the genus.

P. pheretia, Hewitson, from Singapore, certainly belongs to this group. The male on the upperside of the forewing has two pale blue broad streaks from the base, the upper one apparently confined to the discoidal cell, the lower one on the inner margin, with a clavate outer end; four discal spots. Hindwing with the outer two-thirds pale blue, bearing a single blackish dot about the first median interspace. The female is brown on the upperside, the anal third of the wing lilac-white The underside is marked much as in *P. phalena*, Hewitson, but the white band is much narrower. Its description is appended.†

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specimen:—"PREHENSORES, seen from the side. *Uncus* quadrate, the upper angle projecting, rather acute, the lower rounded, retreating; branches long, slender, tapering, not hooked. *Clasps* with a basal tubercle on the upper edge the end enlarged and bilobed, resembling a pair of pincers, the upper thickened beyond the base, bent down to meet the other, but with the tip recurved upwards, the lower lobe regularly curved, tapering, acute. The upper discoidal nervule of the forewing originates from the subcostal nervure some distance beyond the apex of the discoidal cell.'

* "FEMALE. UPPERSIDE, *both wings* blackish, the costa paler; *cilia* paler. UNDERSIDE, *both wings*, rufous-brown, much lighter than in the male, a darker rufous streak across the end of the cell of both wings; a similar slender transverse discal fascia, continuous on the forewing, broken and lunular on the hindwing; a darker outer-discal line, obscure on the forewing, blackish subanally on the hindwing, placed in a paler band, beyond a darker rufous band. *Forewing* with the margin brighter rufous. *Hindwing* with some submarginal blackish scales near the anal angle, and a brighter rufous marginal line bordered inwardly by slender black and white lines subanally." (*Doherty*, l. c.)

† *Poritia pheretia*, Hewitson, Trans. Ent. Soc. Lond., 1874, p. 346; idem, id., Ill. Diurn. Lep., p. 217, n. 9, *P. pheretia*, pl. lxxxix, figs. 17, 18, *male*; 16, *female* (1878); id., Distant, Rhop. Malay., p. 200,

Genus 101.—PSEUDODIPSAS, Felder.

Pseudodipsas, Felder, Wien. Ent. Monatsch, vol. iv, p. 243 (1860).

"*Eyes* naked. *Antennæ* indistinctly ringed, with a very slender, very lengthened, and rather straight club. *Palpi* scaly, scarcely hairy; the second joint half the length of the head in the male, thrice as long in the female; the third joint needle-like, about half the length of the second. FOREWING, with a four-branched subcostal nervure, the third branch emitted from the fourth nearly half way from its base and the apex."

"In the shape of the wings this very delicate species [the type species is *Thecla* (*Pseudodipsas*) *eone*, Felder, from the Aru Islands] reminds one of *Dipsas* [*Pseudodipsas*] *lycænoides*, Felder [from Amboina]; in the form of the head and antennæ it comes near to the group of *Thecla polycletus*, Linnæus, *epicletus*, Felder, *apelles*, Fabricius (section *Hypochrysops*, Felder)." (*Felder*, l. c.)

Dr. Felder placed a single species in this genus when describing it; to this he added, in the "Reise Novara," three others from the Malay Archipelago. Two of these species, *P. sumatræ* and *P. erycinoides*, are true *Poritias*; the third, *P. lycænoides*, from Amboina, is a very curious species, in which the hindwing has two short but well-formed tails, and the markings of the underside remind one of species of the genus *Lampides*, Hubner. Hewitson says that this species belongs to the genus *Lycænesthes*, Moore, but the tails look to me to be too substantial to bring it into that genus. Hewitson goes so far as to say that *P. lycænoides* equals *L. bengalensis*, Moore (=*L. emolus*, Godart), but I think in this he is wrong. Messrs. Hewitson and Miskin have added two more species to *Pseudodipsas* from Australia, while the former described a single species from "India," which is my sole authority for including the genus in this work. *Pseudodipsas* is known to me by figures and descriptions only; I have seen no specimen of it. It appears to be closely allied to *Poritia*, Moore, and is said by Hewitson to have three subcostal nervules to the forewing.

638. Pseudodipsas cephenes, Hewitson.

P. cephenes, Hewitson, Trans. Ent. Soc. Lond., 1874, p. 344, idem, id., Ill. Diurn. Lep., p. 219, n. 3, pl. lxxxix, figs. 3, 4, *female* (1878).

HABITAT. India (*Hewitson*).

EXPANSE: ♀, 1·2 inches.

DESCRIPTION: FEMALE. "UPPERSIDE, *both wings* dark brown *Hindwing* with a submarginal series of five black pyramidal spots, bordered with white UNDERSIDE, *both wings* white, with four or five spots before the middle, both wings crossed beyond the middle by a broad band, all [the markings] slightly darker than the rest of the wing, and bordered with brown. *Forewing* with two submarginal bands of lunular brown spots. *Hindwing* with a minute black spot near the base, and a submarginal series of pyramidal spots; the anal angle and a spot near it, where the outer margin projects, black, crowned with orange." (*Hewitson*, l. c. in Trans. Ent. Soc. Lond.)

From the figures given this is a very plainly coloured and plainly marked species. The upperside is fuliginous, forewing unmarked, hindwing with a prominent anteciliary white line and a series of five submarginal prominent white lunules, their points resting on the anteciliary line, and enclosing black spots. All the markings of the underside are much blurred. It is probable that this species came from Burma, as the late Mr. W. S. Atkinson's collection (from whom Mr. Hewitson obtained the specimen he described) contained many species from that region.

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n. 3, pl. xxii, figs. 9, *male*, 10, *female* (1884). HABITAT: Singapore. EXPANSE: *Male* and *female*, 1·1 to 1·5 inches. DESCRIPTION: "MALE. UPPERSIDE, *forewing* black, with a band from the base to the middle, a band on the inner margin, and a transverse band of four spots beyond the middle, all green-blue. *Hindwing* green-blue, with the costal margin and a spot below the middle dark brown. UNDERSIDE, *both wings* rufous, pale. *Forewing* crossed at the middle by a band of white *Hindwing* irrorated with white at the middle, and crossed by a band of brown spots; three large spots on the outer margin; the two largest at the anal angle, white bordered with black, the middle spot marked with black, the outer spot black. FEMALE. UPPERSIDE, *both wings* rufous-brown. *Hindwing* with the outer half nearly lilac-white. UNDERSIDE like the male, except that the *forewing* is crossed by a second band of white." (*Hewitson*, l. c. in Ill. Diurn. Lep.)

This is another species originally obtained by Mr. A. R. Wallace, which has not apparently been captured since.